No 'Payola' Worries p. 35
Operations Research Today p. 42
Electronic Dust Control p. 52

NOVEMBER 1960

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FOOD ENGINEERING

BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A CHILTON PUBLICATION

BETTER CONTAINER INSPECTION

How *Sterwin* Puts More Profit Into Food Products!

If your food product requires enrichment, color, flavor... then STERWIN can help you save time, money, labor . . . so give you more profit.

For STERWIN offers unique extras in vitamins, colors, vanillin, and these superior ingredients are fitted into your production picture by experts with years of practical and technical experience. These STERWIN Technically Trained Representatives have cut time, expense, production steps for manufacturers producing a widely varied range of food products: candy, bread, margarine, soda, fruit juice, cereals . . . to name just a few.

STERWIN ingredients are delivered when you want them, in the quantity you need. Keeping delivery promises is a STERWIN tradition that helps keep your production at top efficiency.

For new production set-ups or to improve an existing one . . . see your local STERWIN Representative . . . costs you nothing . . . can profit you plenty.

You get these extras when you buy:

STERWIN VITAMINS . . . *the most complete line* in the field . . . immediate delivery in any quantity.

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STERWIN VANILLIN . . . pure, ZIMCO® U.S.P. Vanillin . . . *unlimited supply* of basic material from world's largest vanillin producer.

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FOOD ENGINEERING

BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A CHILTON PUBLICATION
VOL. 32 NO. 11

November, 1960

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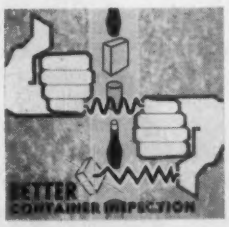

SPECIAL FE REPORT—

Better container inspection methods afford means of maintaining higher product and package quality at lower cost. Automatic-control systems are key to solving inspection problems.—p. 63.

HERCULES

"BEEF-UP" YOUR REPEAT SALES WITH HVP-CENTURY

The initial sale is important but volume is built on repeats. That's why so many food processors are including Hercules HVP®-Century powdered in their formulations for the flavor of well-browned beef. It's a flavor that brings satisfied customers back to the counter again for "seconds."

HVP-Century, a total hydrolyzed vegetable protein derived from wheat protein, contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed.

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A four-page data sheet is available to provide complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. A data sheet and a sample of HVP-Century, which has FDA acceptance for use in many applications, can be obtained by writing:

Huron Milling Division, Virginia Cellulose Department

HERCULES POWDER COMPANY

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FOOD Engineering

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FOOD ENGINEERING (formerly Food Industries) November, 1960, Vol. 32, No. 11.

Published monthly by Chilton Company; Executive, Editorial, Circulation and Advertising Offices, Chestnut & 56th Sts., Phila. 39, Pa. Second class postage paid at Philadelphia, Pa.

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(Pat. Pend.)

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Send sample of your product for FREE demonstration.

There is no surer way to decide whether an FMC "Sterilmatic"* line is *right* for you than to ask leading food processors who are now using these continuous pressure cookers and coolers.

Ask American Home Foods, Division of American Home Products Corp., for example. They installed their first "Sterilmatic" in 1946 in their Chef-Boy-ar-Dee plant at Milton, Pa.

During the years since then, they have specified "Sterilmatic" three times – now have 7 of these lines in the plant, turning out the 53 foods they pack under the famous Chef's label.

You will learn that "Sterilmatic" pioneered a new concept in food processing – one that invariably cuts processing time, assures uniform quality, helps preserve natural color, flavor, texture and nutrients, and minimizes can damage.

The list of "Sterilmatic" users reads like a Blue Book of food processors. Let their use-experience be your guide to better, more profitable food processing.

A 16-page brochure, "The Sterilmatic Story," gives full details and is yours for the asking. Write for it – today.

*FMC "Sterilmatic" Continuous Pressure Cooker and Cooler – Trade Mark – Reg. U. S. Pat. Off.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division

General Sales Offices:
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TRENDS & FORECASTS

U. S. economy will wind up year with record gross national product of about $504 billion. In '61 GNP will be about $510 billion, with some letdown early in '61, says economist Dexter Keezer.

There is backlog of $35 billion of consumer demand which could be turned into 10% sales increase, in opinion of economist Arno H. Johnson. This presents challenge to food manufacturers.

Demand for food is expected to continue strong in final quarter of '60. Food supplies should be large, with prices declining somewhat, according to Bureau of Commercial Fisheries.

Retail food sales reached $13.5 billion in 2nd quarter of '60, 5½% higher than last year, GMA reports.

Retail sales in August were 5% over '59; restaurant sales, 2%.

Food plant production workers were paid $2.18 an hour in July, 9c. higher than year ago. Weekly earnings averaged $88.94, up $3.42, larger gain than for manufacturing workers generally.

Exports of crude and manufactured foodstuffs reached $675 million, in 2nd quarter, up 7½% over last year. For first half, gain is 10%.

Factory production of processed farm foods increased at rate of 2.6% per year between '47 and '58, USDA reports. This is faster than prewar rate, but slower than in World War II years.

Outlook for can shipments in '61 is forecast at 3½% to 4% over '60. Twice as many cans are being used for soft drinks in '60 than in '59.

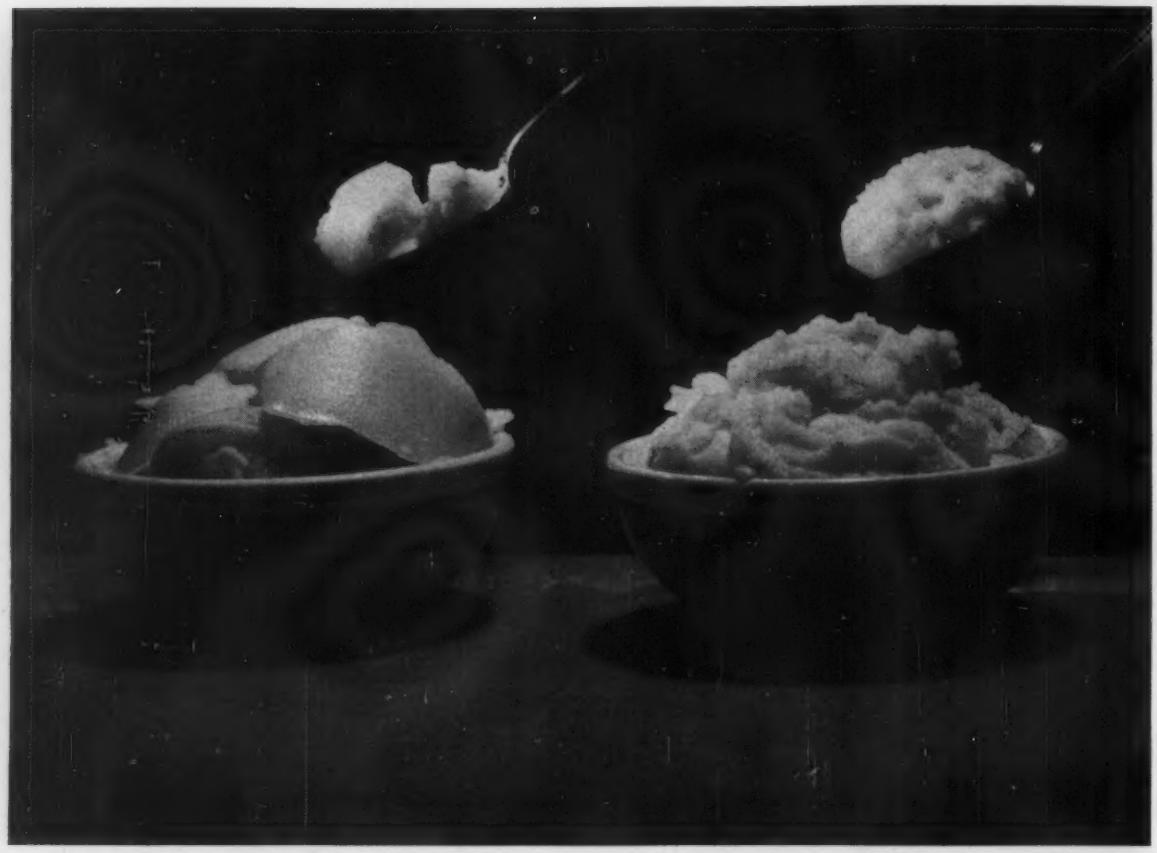
Of consumer's food dollar, 4.03¢ went for frozen foods in '58, compared to 3.93¢ in '56. Frozen potato items have gained fastest in per capita consumption—from 0.74 lb. in '55 to 2.07 lb. in '59.

Freezing now takes about 8% of vegetable production, compared to 4% ten years ago. Pack increased from 563 million lb. in '49 to 1.6 billon lb. in '59. Institutional pack rose from 35% in '49 to 45% in '59.

Confections rank second to cigarettes in sales via vending machines, according to survey by *Vend Magazine.* Expenditure for packaged and bulk confections amounts to more than $330 million.

See Developments to Watch p. 13

Rate of profit after taxes amounted to 11.8% on investment for dairy firms in '58. This compares with 9.2% in '40, and 11.9% in '57. Baking companies earned 10.4% in '58, 7.9% in '40 and 11.4% in '57.



Try this texture trick

Pour ½ cup of plain, dry farina and a teaspoonful of salt into 3 cups of boiling water and cook until done. To another ½ cup of the same dry farina, add 3% of *Myverol*® *Distilled Monoglycerides, Type 18-07*, little white beads closely resembling the farina itself in appearance. (Write us for a free sample.) Pour *that* with its teaspoonful of salt into 3 cups of water, not boiling but at any temperature below 140 F. Then boil *that* until done.

Now set both pans aside for a few hours. Keep them both warm or let them both cool. It doesn't matter.

Come back and note which panful has turned into a jellylike mass and which still looks and behaves as it did at the moment the cooking was finished. See if you can taste a difference. (You can't.)

The difference is that the monoglyceride has complexed dissolved amylose and has thereby prevented gelation. The effect works with any starchy food.* We demonstrate with farina just because it photographs well!

Write for your sample of *Myverol Distilled Monoglycerides, Type 18-07*, to ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

*Being made by glycerolysis of edible fats or oils and officially recognized as safe, *Myverol Distilled Monoglycerides* are exempt from the Food Additives Amendment.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

Schedule of Events

November

13-19—International Assn. of Ice Cream Manufacturers, courses; Granville Inn, Granville, O.
14-16—National Potato Council, meeting; Hotel Washington, Washington, D. C.
14-17—American Bottlers of Carbonated Beverages, meeting; Cobo Hall, Detroit, Mich.
18-22—Air-conditioning and Refrigeration Institute, annual meeting; Hollywood Beach Hotel, Hollywood Beach, Fla.
26-Dec. 1—American Society of Mechanical Engineers, meeting; Statler-Hilton, N. Y. C.
27-30—National Assn. of Food Chains, annual meeting, Americana Hotel, Miami Beach, Fla.
28-Dec. 1—Vegetable Growers Assn. of America, meeting; Auditorium-Arena, Milwaukee, Wis.

December

5-6—Tri-State Packers Assn., meeting; Lord Baltimore Hotel, Baltimore, Md.
10-14—National Food Brokers Assn., conference; Chicago.
28-30—American Marketing Assn., winter conference, Coronado Hotel, St. Louis, Mo.

HORS D'OEUVRES

Automation ups productivity, boosts business volume, and creates more jobs, says Teamster Union's Hoffa. It hurts to agree with him.

"Skillful use of technological advances will be required to meet the demand for convenience foods." So says GF's Mortimer. It takes smart food technologists to develop idiot items for marketing now.

Food fallacies, such as the notion that oysters increase fertility, are harmless, observes FDA. But when garlic pills are promoted for high blood pressure, or grapes for ulcers and cancer, the price of ignorance can come high.

Enough food must be produced by a few to free and feed the many required to operate an industrial complex. This, observes Michigan U's Dr. Gosling, is the crack in China's future.

New varieties of potatoes cannot be patented. 'Tis a wicked world.

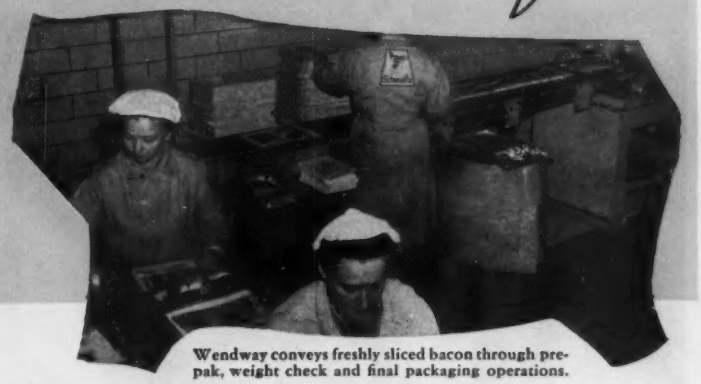
National Confectioners Assn. promotes Oct. 15 as "Sweetest Day." It is a time to spread cheer with small gifts—and candy is just dandy.

An early New York merchant distributed samples of tea in silk bags. One lazy customer poured water over the tea without taking it out of the bag. But industry invented the string.

Of 100 top advertisers, 31 are food manufacturers. Judging by TV, the others are manufacturers of non-food items for our ugly innards.

One restauranteur serves nothing but frozen prepared foods heated in electronic ovens. Such genius should be rewarded.

NO MATTER HOW YOU SLICE IT.....



Wendway conveys freshly sliced bacon through prepak, weight check and final packaging operations.

WENDWAY CUTS MEAT HANDLING COSTS!

Narrow belt Wendway systems are ideal for processing, labeling, packaging and inspection of delicate products, cartons.

Wendway is the practical answer for conveying fresh, unwrapped food products. Belting will not mar product or package.

Wendway belting is available in a wide selection of standard widths to match every requirement.

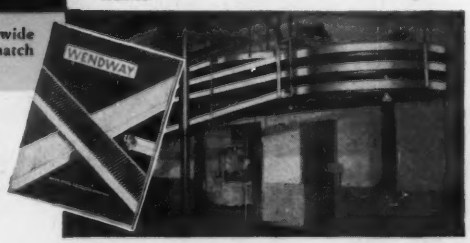
Wendway is the one versatile conveying system that gained the complete acceptance of the nation's top processing and packing plants. Wendway's stainless steel wire belting is ideal for the conveying of meats or other food products—packaged or unpackaged. It permits free circulation of air from above or below, does not sag or accumulate fats or grease and can be kept highly sanitary with hot water or steam scalding.

A Wendway system in your plant will quickly pay for itself in tangible, provable savings of man hours, floor space and the elimination of multiple handling. All...while conveying your products swiftly, silently, safely and *economically* to any desired location.

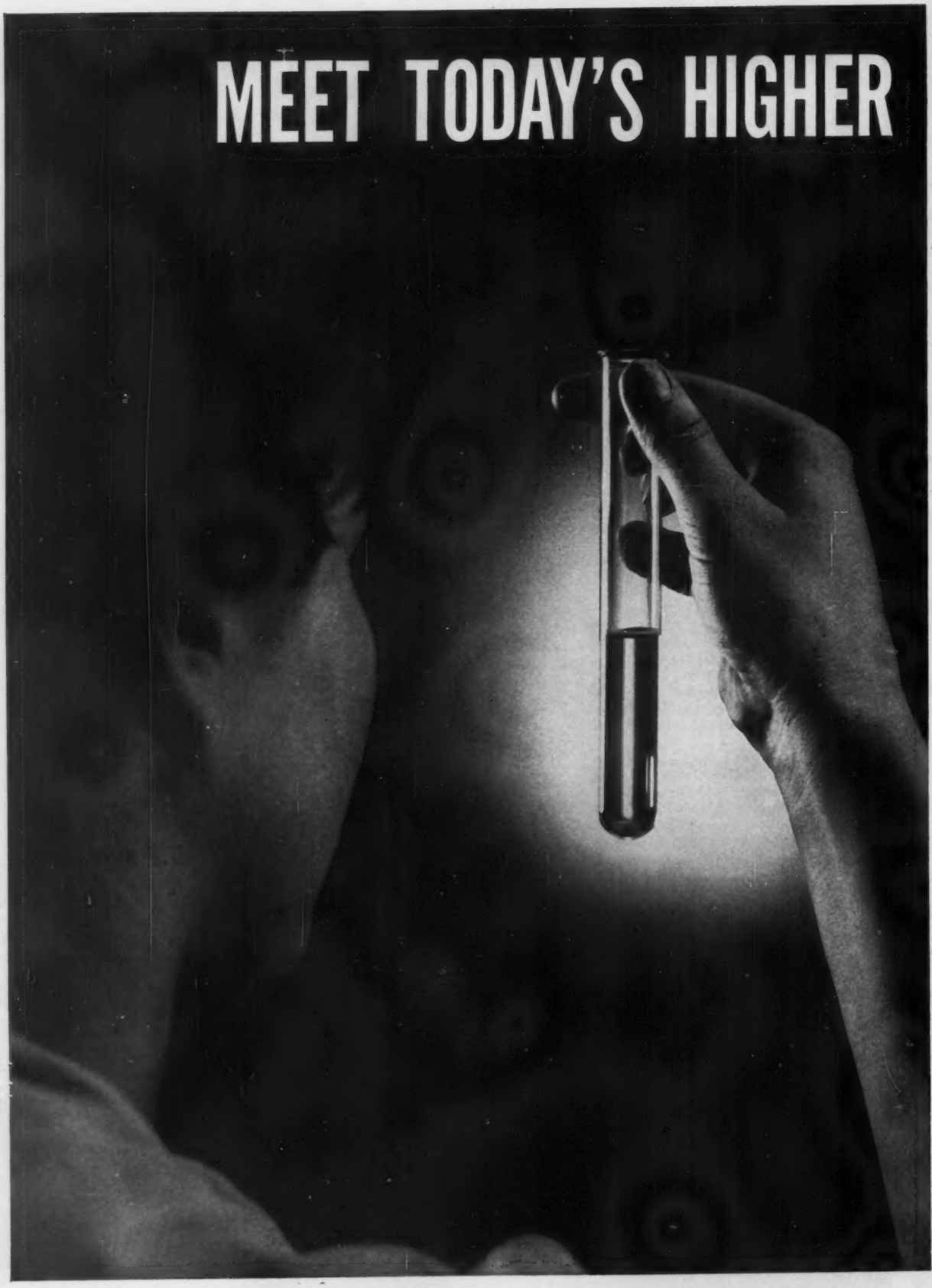
Prove it to yourself, investigate Wendway today!

UNION STEEL PRODUCTS CO.
Industrial Conveyor Division
ALBION, MICHIGAN

Overhead cooling for cooked or heated products saves time, handling and floor space. Wendway is unaffected by temperature extremes.



Write today... for additional information, literature and specifications to match your conveying requirements.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PURITY STANDARDS WITH DICALITE FILTERAIDS

DICALITE OFFERS NEW CUSTOMIZED FILTERAID SERVICE

Today, standards of purity are tightening in every field—and tomorrow's will be higher still. But you can confidently meet both with the high-efficiency filteraids which Dicalite is producing right now.

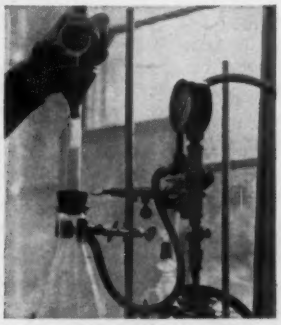
Today, with new processing advances made through continuing research, Dicalite can custom-engineer a filteraid made to precisely match your individual purity problem.

If your filtration must be so sharp that it removes particles too small to be seen with the optical microscope, a Dicalite Filteraid can do it. Or, if fast flow rates and increased production are your need, Dicalite can help you achieve that.

Your Dicalite man will be glad to advise with you on any filtration problem and help you determine if a customized filteraid will advance your processing.

Careful strata selection provides the best crude for each filteraid's final requirements.

New processing refinements, including special calcining methods, control filteraid characteristics with an accuracy never before possible in any plant.



With more than 22,000 quality control tests every month, the Dicalite plant laboratories hold every filteraid grade to rigid specifications.

New automatically-controlled packing and pressure-palletizing is the final step in efficient modern operation.

Dicalite®

Dicalite Department
Great Lakes Carbon Corporation
612 So. Flower Street, Los Angeles 17, Calif.

The product I am filtering is _____ FE-3

Have Dicalite man phone for appointment ☐ Send Information ☐

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

NEWEST DATA / ROCHE® Beta CAROTENE

The SAFE yellow-to-orange COLOR that NOURISHES

Roche has all the types of beta carotene you'll need, no matter what you're processing. Roche packings are made with your needs in mind. Summarized below is information you'll find helpful—

TECHNICAL INFORMATION —Beta CAROTENE Roche crystals

Crystalline Beta CAROTENE Roche is in the all-trans form. It is not a mixture of isomers of varying coloring value. Roche Beta CAROTENE is 100% provitamin A, the preferred carotene for use in foods.

Empirical Formula:	$C_{40}H_{56}$
Molecular Weight:	536.85
Melting Point:	183.0

Appearance: Red-violet platelets

Solubility in Edible Oils:

At room temperatures about 0.08%
At 45° C 0.2%
At 140° C ..... 6.0% *

Biological Properties:

0.6 microgram of beta carotene = 1.0 U.S.P. unit of vitamin A
1.0 gram of beta carotene = 1,666,667 U.S.P. units of vitamin A

*Carotene will recrystallize on cooling. One percent solutions will remain dissolved for approximately 8 hours at room temperature. Some isomerization and destruction take place at this temperature.

MARKET FORMS & PACKINGS— Beta CAROTENE Roche

Crystalline Beta CAROTENE—1,666,667 U.S.P. units of vitamin A activity per gram.

Packed: in polyethylene bag in hermetically sealed sanitary can containing 100 grams.

30% Beta CAROTENE in vegetable oil—500,000 U.S.P. units of vitamin A activity per gram. In vegetable oil. Each gram contains 0.30 gram of beta carotene.

Packed as follows: 1 pound (0.4536 kilo) and 3 pounds (1.361 kilo) in Tripletite Tamperpruf metal can. 33 pounds (14.97 kilo) in steel pail, Synthetasine-lined, Leverlok Tamperpruf cover.

24% Beta CAROTENE, Semi-Solid Suspension—400,000 U.S.P. units of vitamin A activity per gram. In vegetable oil. Each gram contains 0.24 grams of beta carotene.

Packed: available in 1 pound (0.4536 kilo) and 3 pounds (1.361 kilo) Tripletite Tamperpruf metal containers.

Beta CAROTENE and Vitamin A Blends—Roche Beta CAROTENE and Roche Vitamin A (acetate or palmitate) are blended in vegetable oil according to your specifications. A range of potencies is available, including high-potency blend with no oil dilution.
Packed: in sealed, sanitary, batch-size cans.

Beta CAROTENE Blends—Dilutions of Beta CAROTENE Roche are made in vegetable oil. Minimum dilution—6% which is equivalent to 100,000 U.S.P. units of vitamin A activity or 0.06 gram of beta carotene per gram of blend.

Packed: in batch-size, sanitary sealed cans.

Dry Beta CAROTENE Beadlets, Type 2.4-S—Water-dispersible, free-flowing beadlets. Each gram contains approximately 40,000 U.S.P. units of vitamin A as beta carotene.

Packed: in polyethylene bags in fibre drums up to 50 kilos. Also in polyethylene bags in one- and two-kilo Tamperpruf metal containers.

USE IN FOODS

Safe-Sure-Yellow-Pure Roche Beta CAROTENE gives SAFE yellow-to-orange color and nutritional value to such foods as:

Margarine—Salad & Cooking Oils—Mellorine & Ice Cream Products—Pie Crust & Cake Mixes—Shortening—Baked Goods—Fruit Drinks, Fruit Juices & Concentrates—Puddings & Egg Yolk Products—Frozen Foods—Gelatin Desserts—Confections—Dessert Toppings—Popcorn—Cheese—Soups—Creamed Foods.

Safety Proven. Beta carotene, one of nature's own colors in foods, has been consumed for thousands of years. Despite this evident record of safety, Roche did not market its beta carotene until it had been tested over a long period of time for acute and chronic toxicity. These tests proved beyond doubt that Roche Beta CAROTENE is *safe*.

Nutritive Value. Roche Beta CAROTENE is a provitamin A. It is converted within the human body to vitamin A.

Stability. Excellent stability has been demonstrated by extensive laboratory tests and years of widespread commercial use.

True Color. Roche Beta CAROTENE gives foods true, natural-looking color without any tinge of green. No change to a reddish color happens during storage, as may occur with some vegetable pigments.

Technical Service and Samples are yours for the asking. Your Roche salesman will help, or phone or write Roche directly.

ROCHE
ROUND THE WORLD

Vitamins come RIGHT from Roche

FINE CHEMICALS DIVISION **HOFFMANN-LA ROCHE INC.**

Nutley 10, New Jersey: NOrth 7-5000 • New York City: OXford 5-1400

Roche Round The World

AFFILIATED COMPANIES: BASEL • BOGOTA • BOMBAY • BRUSSELS • BUENOS AIRES • GRENZACH (GERMANY) • ISTANBUL • JOHANNESBURG • LONDON • MADRID
MEXICO CITY • MILAN • MONTEVIDEO • MONTREAL • PARIS • RIO DE JANEIRO • STOCKHOLM • SYDNEY • TOKYO • AGENCIES IN OTHER COUNTRIES

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DEVELOPMENTS TO WATCH

Frozen, unsalted margarine made 100% from corn oil has been introduced by Standard Brands. It has linoleic acid (unsaturated) content of 30% for two-way dietary appeal. Costs 10¢ more.

Thickness of liquid fudge on a continuous belt is measured by rays from radio-active isotope beamed across belt. Similar device controls level of meat in hoppers of emulsifiers.

Green Giant's new, continuous, short-time, high-temperature process for cream-style corn retains 13% more vitamin C, 23% more vitamin B_2, 13% more vitamin A. Color and flavor are improved, too.

Flavor of orange juice is being protected by nitrogen. Inert gas replaces air in sparging operation after extraction and finishing. Chilled juice is shipped under nitrogen blanket to protect flavor.

Voluntary USDA inspection now is available to processors of bouillon cubes, pork and beans, sandwiches and certain other foods.

To increase emphasis on food science and basic research oriented toward problems of nutrition and toxicology, MIT has changed its Food Technology Department to Department of Nutrition, Food Science and Technology.

Fresh peaches with "amazing" keeping quality are produced when seaweed minerals are used as fertilizer, research at Clemson indicates. Green Bell sweet peppers, melons, okra, tomatoes, and sweet corn are improved in quality and yield.

Powder with 67% albumen content, tasteless and entirely neutral, is produced in Sweden. It is made of skim milk from which milk sugar and milk salt have been extracted. It speeds healing of wounds.

Drastic reduction in time required to tenderize beef by aging may be achieved soon by elevating body temperature of animal through electronic heating. Spoilage would be prevented by an antibiotic.

New microbial insecticide, safe for use on food crops, has been developed by Bioferm. Active ingredient belongs to unusual class of bacterial diseases which affect certain insects.

See Who's Building What p. 17

Several Teflon resins have been approved by FDA for use in food handling operations. Teflon is used to impregnate conveyor belts and in gaskets, bearings, nozzles and other food machinery parts.

Washington Report p. 25

Fifth International Food Congress will be held in New York Coliseum in 1962, Sept. 8-16. Some 3,000 world leaders in food manufacturing and distribution, from 30 countries, are expected to attend.

KELCO COMPANY

KELCO
REG. U.S. PAT. OFF.
REFINED ALGIN PRODUCTS

technical bulletin

Use unique Kelco Algin Colloids to improve your food products

Use Keltone In Pre-packaged Dry-Mix — Chiffons, meringues and other fillings look fresh and stay fresh far longer. Keltone produces a smoother, creamier texture. Makes preparation easier.

Use Kelco-Gel HV In Salad And Dessert Gels — Made in 3 minutes, cold if desired, and gelling in half-hour, or less, salad and dessert gels made with Kelco-Gel HV are clear, sparkling and tender — won't melt at room temperatures. Mold release is fast and clean.

Use Kelco Algin Colloids In Pressurized Foods — Effectively stabilized with Kelco Algin colloids, aerosol-dispensed whipped toppings, syrups, flavors and sauces have far longer shelf life.

No More Effective Way to Make Foods Stay Fresh Longer

Unique Kelco Algin Colloids Help You Create New Food Products

For example, less than 1 teaspoon of Kelco algin per pound of food product produces high volume whip, easier mixing, more tender texture, and retarded weeping (syneresis).

Whatever your product, packaged dry mix or beverage, emulsion or suspension, sauce or syrup, there's a Kelco algin colloid to provide important benefits. At your service, too, are our highly qualified food technicians, ready to give individual attention to your needs or problems.

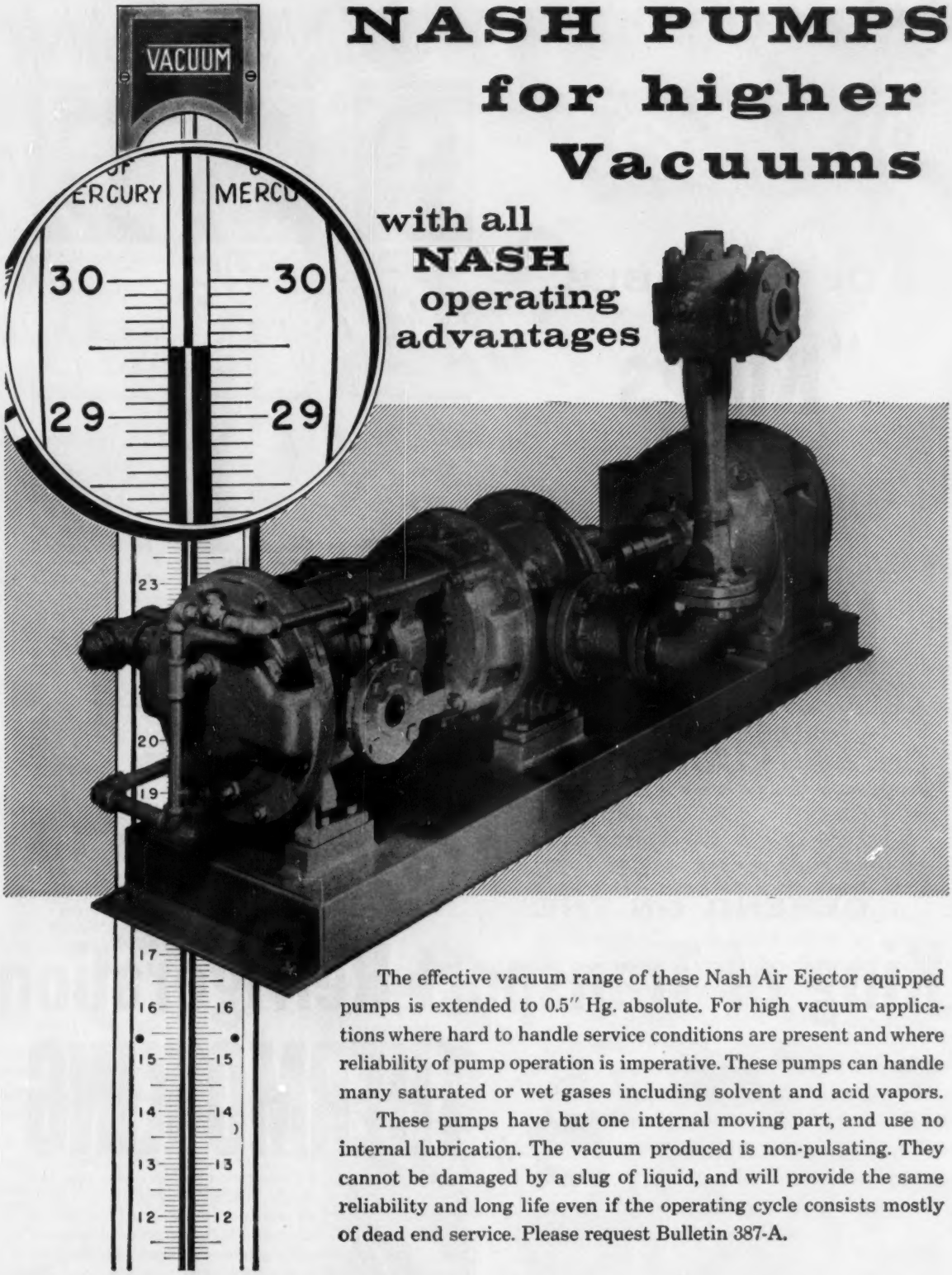
YOURS ON REQUEST: Free samples of Kelco algins, and Technical Data describing properties, advantages, and uses in *your* application. Write without obligation to your nearest Kelco regional office.

Keltone® Kelco-Gel HV® Kelco-Gel LV® ***products of*** **Kelco Company**

75 Terminal Avenue, Clark, New Jersey • 20 N. Wacker Drive, Chicago 6, Illinois • 530 W. Sixth Street, Los Angeles 14, Calif.
Cable Address: KELCOALGIN — CLARKNEWJERSEY

NASH PUMPS for higher Vacuums

with all NASH operating advantages



The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

These pumps have but one internal moving part, and use no internal lubrication. The vacuum produced is non-pulsating. They cannot be damaged by a slug of liquid, and will provide the same reliability and long life even if the operating cycle consists mostly of dead end service. Please request Bulletin 387-A.

NASH ENGINEERING COMPANY

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DEPENDABLE

"Kings of the Highway"

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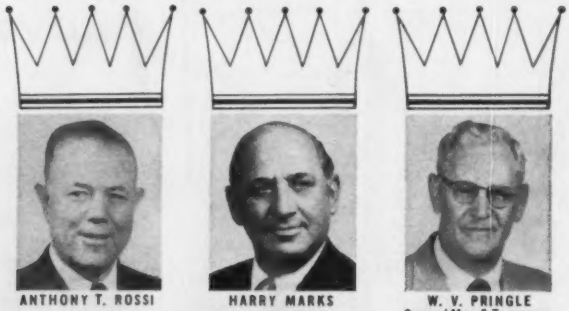
President, Meads Frozen Foods
Abilene, Tex.

H. W. ROBERTS
John Morrell & Co.
Sioux Falls, S. Dak.

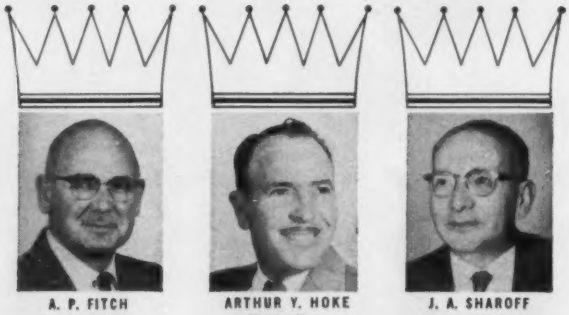
E. H. FLITTON
General Trans. Mgr.,
George A. Hormel & Co.
Austin, Minn.



ANTHONY T. ROSSI
Tropicana Products, Inc.
Bradenton, Fla.

HARRY MARKS
M & M
Transportation Co.
Somerville, Mass.

W. V. PRINGLE
General Mgr. & Treasurer,
Rockingham Poultry
Mktg. Cooperative, Inc,
Broadway, Va.



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Hopkins, Minn.

ARTHUR Y. HOKE
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Produce Distributors
Aurora, Colo.

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DEPEND ON THE

King of Transport Refrigeration

THERMO KING

No matter what your refrigeration problem, you, too, can depend on Thermo King. Thermo King offers you fully automatic cooling and heating in the size unit and power plant you need. Self-contained units are powered by gasoline, diesel, propane, or electricity. 23 years of specialized experience guarantees you *most capacity at least cost.* Interested? Write us for more details.

World Leader in Transport Temperature Control

THERMO KING CORP.

314 West 90th Street • Minneapolis 20, Minnesota

Who's Building What ...

Monthly Reports: These food firms will spend $7,899,200 for expansion.

Low Bids/Contracts

American Bakeries Co., Orlando, Fla., plant, $899,200.

Aunt Nellies Foods, Clyman, Wis., warehouse, $200,000.

C. Schmidt & Sons, Philadelphia, Pa., bottling plant, $110,000.

Entenmanns Bakery, Inc., Bayshore, N. Y., bakery plant, $200,000.

M. L. Hunt Products Co., Dallas, Tex., food processing plant, $400,000.

National Brewing Co., Baltimore, Md., brewery addn., $175,000.

National Dairy Products Corp., Newark, N. J., office addn., $450,000.

Oscar Mayer & Co., Jacksonville, Fla., meat distribution center, $115,000.

Pepsi-Cola Co., Durham, N. C., bottling plant, $200,000.

Sealtest Southern Dairy Div., Florence, S. C., dairy processing plant, $150,000.

Swift & Co., Rochelle, Ill., meat packing plant, $5,000,000.

Proposed Work

Bauer Chocolate Co., Brantford, Ont., factory, $500,000.

Boillin-Harrison Corp., Clarksville, Tenn., warehouse, $200,000.

Cargo Candy Co., Bristol, Pa., candy mfg. and distribution plant, $110,000.

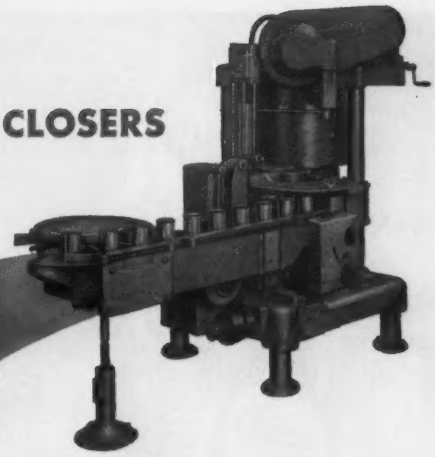
Hershey Chocolate Corp., Smith Falls, Ont., plant, $7,000,000.

New England Tea Packing Co., Inc., Roxbury, Mass., warehouse addn., $114,000.

Standard Brands, Inc., Pennsauken, N. J., plant, $250,000.

The Frito Co., Grand Prairie, Tex., plant, $750,000.

ANGELUS CAN CLOSERS



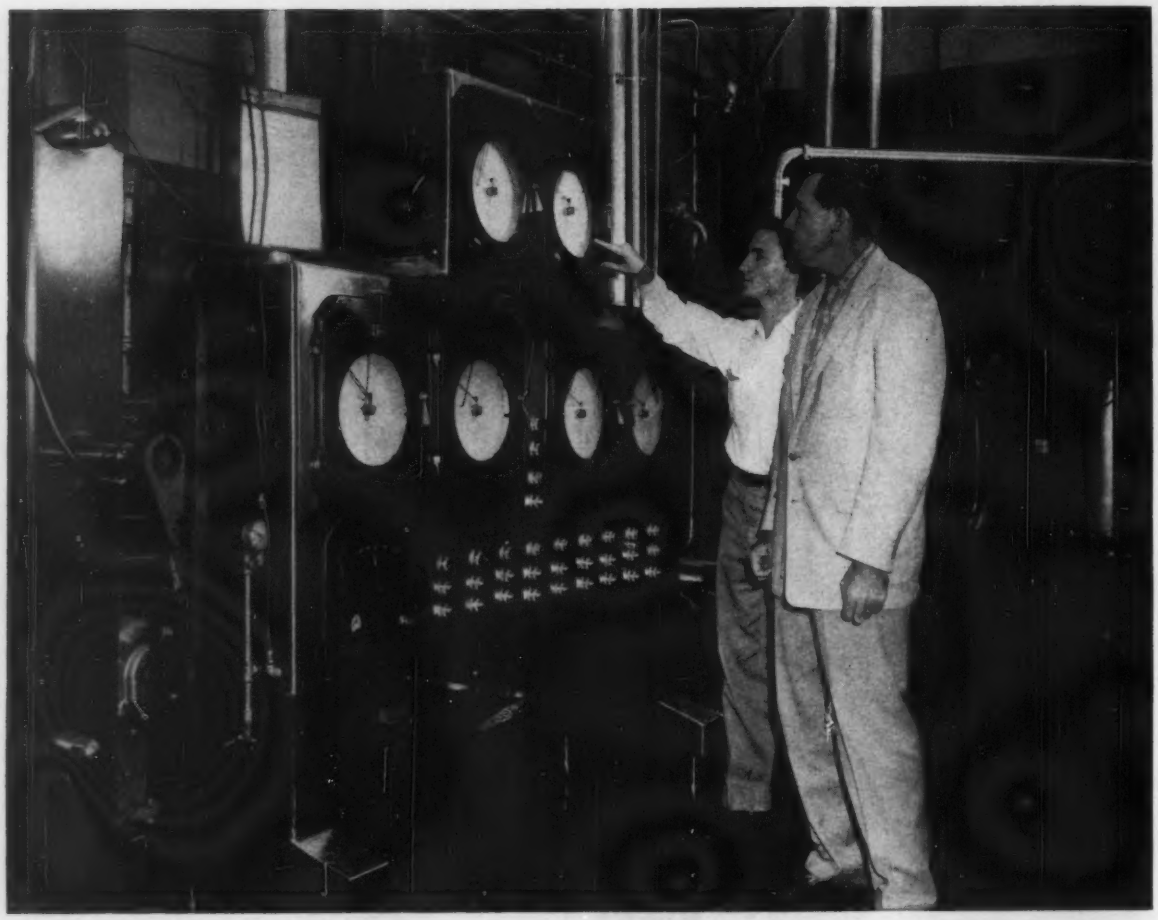
KNOWN FOR THE COMPANY THEY KEEP...
KNOWN FOR THE SERVICE THEY PROVIDE

No better recommendation exists than the list of "blue chip" customers who use one or more models of Angelus Closing Machines for efficient and cost-cutting service.

The performance of Angelus Closing Machines is based not only on top-grade materials and quality of workmanship but on the right design to meet specific production problems. These leading canners know that Angelus, the only company in the world producing can closing machines exclusively, devotes all of its design efforts to create equipment for greatest production efficiency and easiest possible maintenance.

Let Angelus put its 50 years of experience to work in solving your can closing production problems. Write today for complete details. Specify products, can dimensions and your capacity requirements.

ANGELUS
Sanitary Can Machine Company
Cable Address "Angelmaco" Western Union Code
4900 Pacific Boulevard • Los Angeles 58, Calif.



NEW EQUIPMENT PAYS OFF FOR TEXAS DAIRY

DeLaval HTST and VacuTherm units under Taylor control

At VANDERVOORT'S, INC., Fort Worth, Texas, company officials say their new equipment is performing excellently. Not only is processing time considerably reduced, but their products have longer shelf life. They are also assured of constant flavor control.

In photo above, Mr. David Vandervoort checks processing conditions from the Taylor central control panel. In addition to a standard Taylor Packaged HTST Control System, (twin instruments at right), the panel includes a FULSCOPE* Temperature Controller for regulating steam injection prior to the vacuum chamber, a Ratio Controller for the Vacu-Therm unit, a Cold Milk Recorder and a Safety Thermal Limit Recorder.

Whatever your process control requirements, there's a Taylor system designed to do the job efficiently, simply, economically. And remember that Taylor's years of experience in serving the Dairy Industry are at your service.

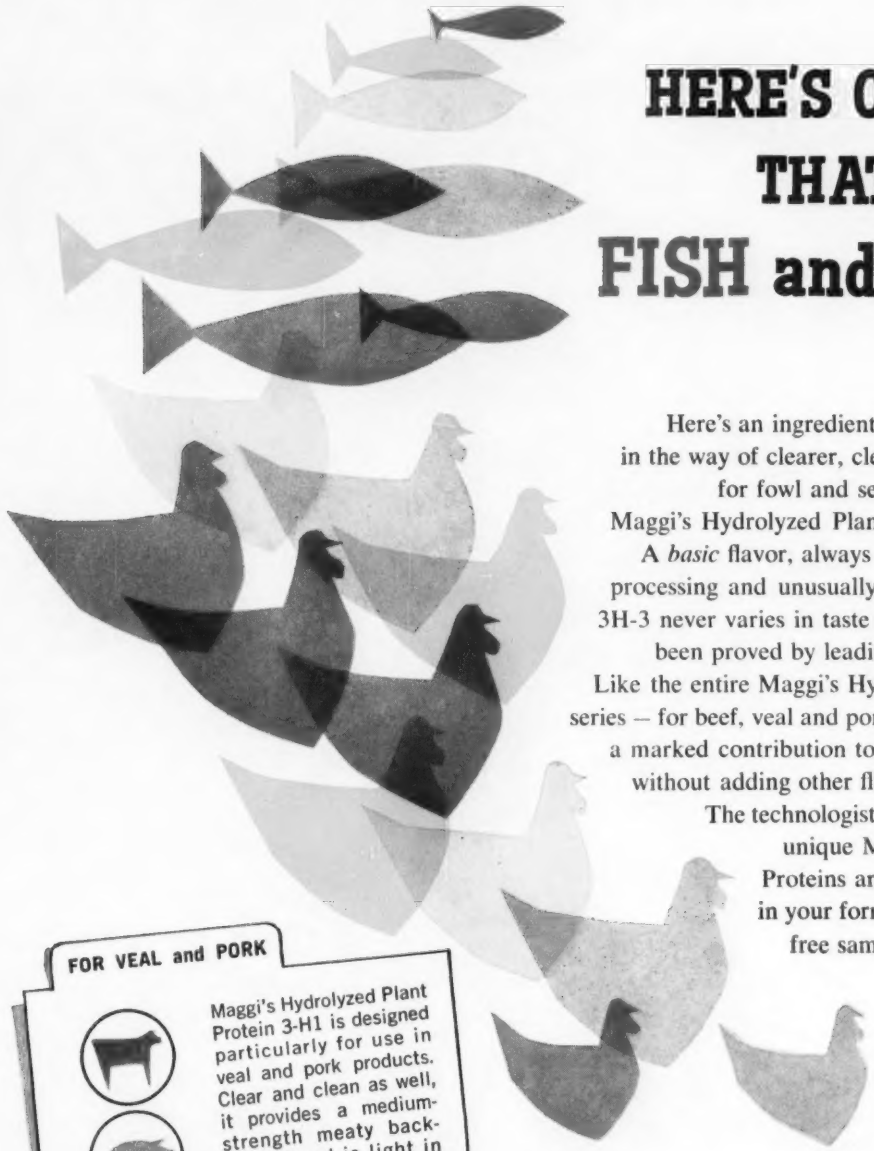
• • •

See your Dairy Equipment Supplier, or write for **Catalog 500A.** *Taylor Instrument Companies, Rochester, N.Y., and Toronto, Ont.*

*Reg. U.S. Pat. Off.

Taylor Instruments **MEAN ACCURACY FIRST**

MORE THAN A SUBSTITUTE



HERE'S ONE THAT'S BOTH FISH and FOWL

Here's an ingredient that gives you *everything* in the way of clearer, cleaner, better flavor for fowl and sea food products — new Maggi's Hydrolyzed Plant Protein 3H-3.

A *basic* flavor, always uniform, unaffected by processing and unusually economical, Maggi's 3H-3 never varies in taste or quality, has been proved by leading processors.

Like the entire Maggi's Hydrolyzed Plant Protein series — for beef, veal and pork, too — 3H-3 makes a marked contribution to the desired flavor without adding other flavor characteristics.

The technologists who developed these unique Maggi's Hydrolyzed Plant Proteins are available to assist you in your formulations. Write for free samples and data.

FOR VEAL and PORK

Maggi's Hydrolyzed Plant Protein 3-H1 is designed particularly for use in veal and pork products. Clear and clean as well, it provides a medium-strength meaty background and is light in color.

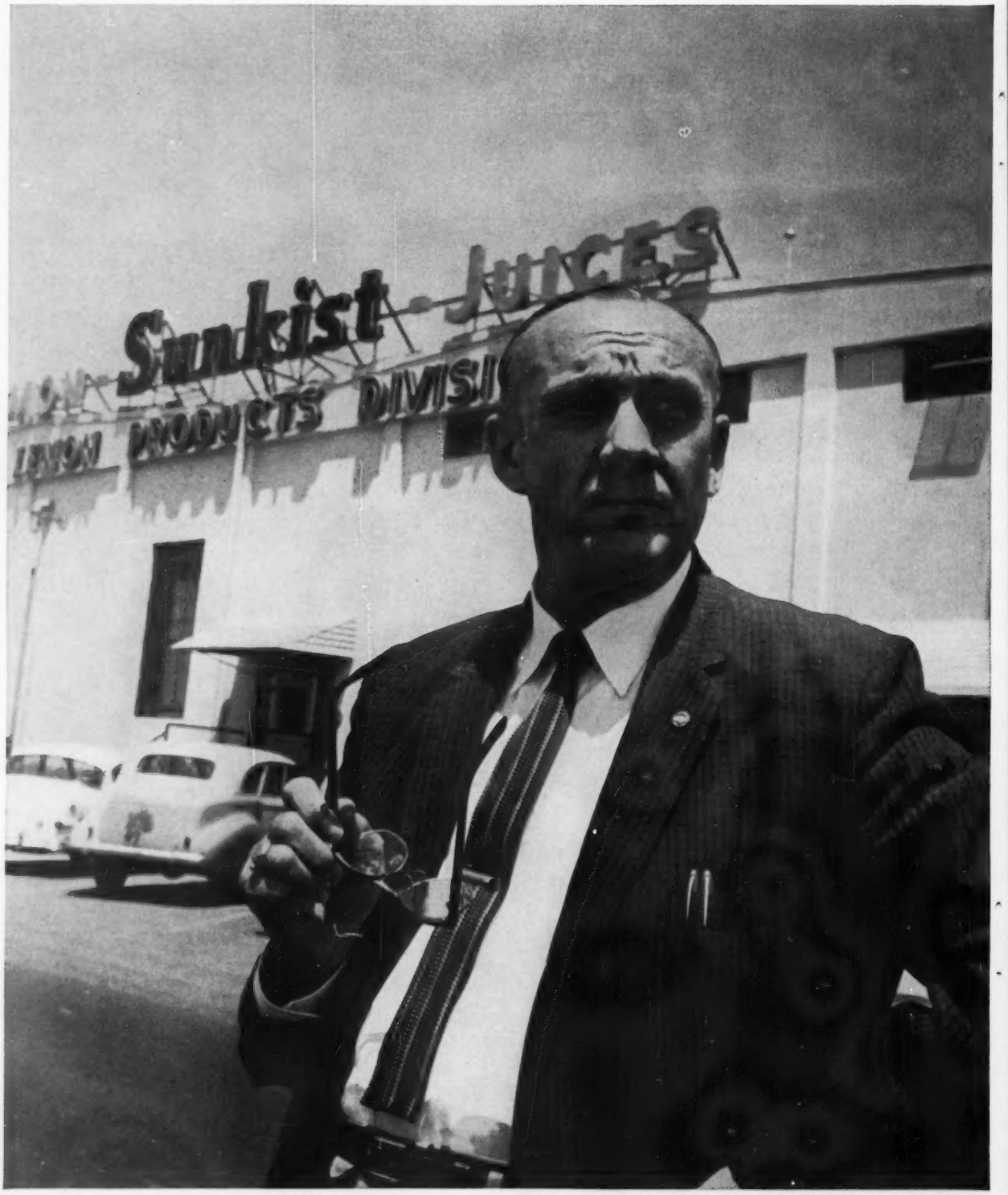
FOR BEEF FLAVOR — MAGGI's 4-BE and 4-BE-2
Available in Liquid, Paste or Powder form

MAGGI's®
HYDROLYZED PLANT PROTEINS

Prepared by the makers of world famous **MAGGI's** *seasoning*

THE NESTLÉ COMPANY, INC.
WHITE PLAINS, N. Y.

DOW | INSULATION



James S. Hutchison, chief engineer for Lemon Products Division, Sunkist Growers, who utilized nearly 400,000 board-feet of Styrofoam in a new warehouse at Corona, California.

STYROFOAM®

Approved Insulation Contractor relieves Sunkist of detail on low-temp installation for new warehouse

"Styrofoam*, installed by a Dow Approved Insulation Contractor," reports James S. Hutchison, chief engineer for the Lemon Products Division, Sunkist Growers, "gives us the advantages of a permanent, moisture-sealed, maintenance-free insulation job." The AIC, Los Angeles Cork Company, installed nearly 400,000 board-feet of Styrofoam in a new warehouse that's so large it can hold enough frozen concentrate to make a four-ounce glass of lemonade for every U.S. citizen.

"Having an AIC do the job meant that we didn't have to spend expensive engineering time to 'nursemaid' the project," Mr. Hutchison points out. "Then too, the inspectors which Dow provided undoubtedly were much more familiar with this type of construction than we. In short, we were relieved of maintaining a time-consuming, laborious inspection program, without risking any defects in workmanship."

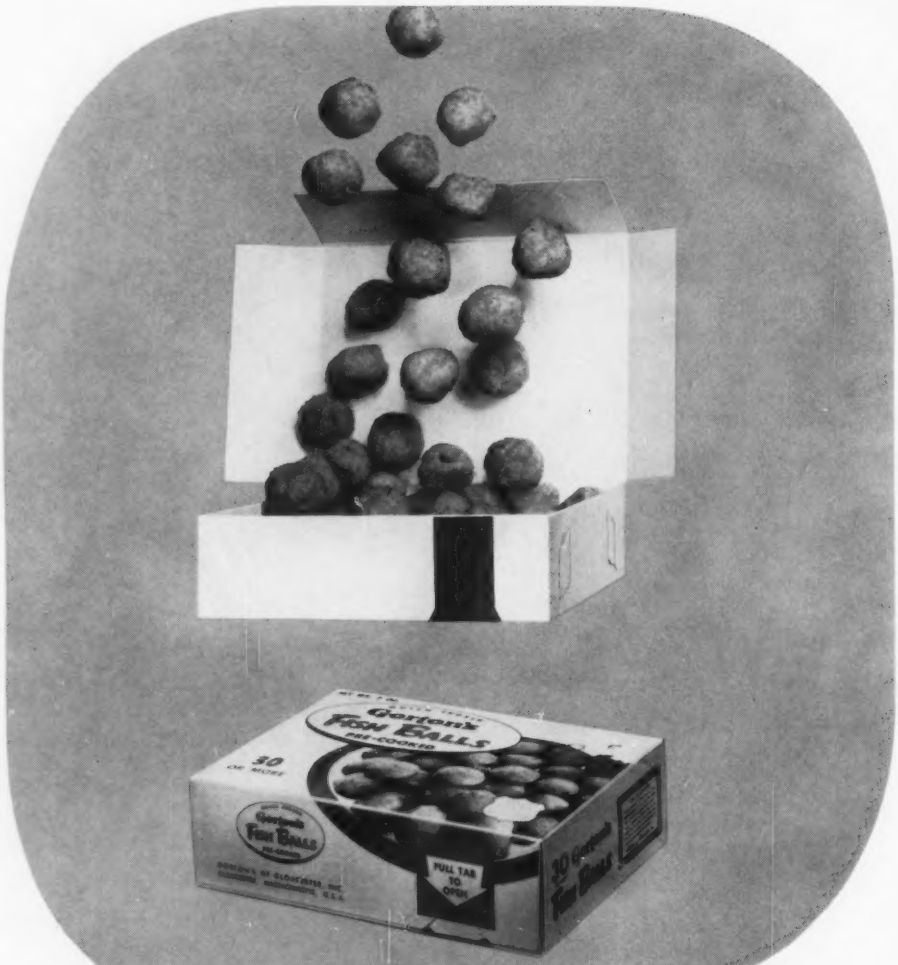
As Sunkist found out from first-hand testing, neither water nor water vapor penetrates Styrofoam, which makes its high insulating efficiency (low "K" factor) *permanent*. "Competitive insulating materials were checked for their resistance to vapor passage," Mr. Hutchison reports. "We couldn't even get a pressure drop through the Styrofoam."

As Sunkist discovered by careful investigation of insulation materials and contractors, the AIC certificate is awarded by Dow only to carefully selected contractors capable of providing technical design assistance, followed by expert installation. Los Angeles Cork Company is typical of more than 90 Approved Insulation Contractors located throughout the country. For the names of the ones nearest you, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1642KE11.

**Dow's registered trademark for its expanded polystyrene*

See "The Dow Hour of Great Mysteries" on TV

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN



CCA

Gorton's High-Efficiency Secret:

Seal Top-Loaded Printed Cartons with High-Frequency Waves

Gorton's of Gloucester, on a single line, packs seven different seafoods in wrapperless cartons—thanks to CCA's versatile top-loading Di-Electric Sealer*. Di-Electric seals securely when high-frequency waves activate cold glue—no de-waxing. Top-loading provides product flexibility. Di-Electric gives package flexibility—seals hand- or machine-loaded cartons, adjusts to varying sizes. CCA printed cartons combine product protection with sales appeal—no overwrap needed. To **pack it—move it—sell it** is the business of CCA packaging.

*Patented

CONTAINER CORPORATION OF AMERICA

World's largest producer of paperboard packaging Chicago 3...Local service from 122 strategically located manufacturing centers

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CIRCLE 22 ON READER SERVICE CARD

CIRCLE 23 ON READER SERVICE CARD ➔

A wide variety of food products enjoy increased appetite appeal seasoned with Bakon Yeast.

Exciting New Smoked Flavor for foods

Food products, plain or seasoned, get a zestful flavor boost with hickory-smoked Bakon® Yeast. Tasty Bakon is a U.S.P. Dried Torula Yeast, salt free, and genuinely smoked for an authentic bacon-like flavor. It carries 50% protein and the entire vitamin B complex. Bakon is stable and uniform. It contains no starch, sugar or meat. Discover for yourself why many important food firms now incorporate hickory-smoked Bakon Yeast into their products.

Send for your complimentary test sample today.

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Manufacturer and distributor of Bakon Yeast

Lake States Yeast and Chemical Division
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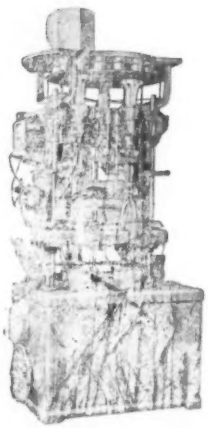
FMC Stokeswrap is "performance-proved" for dependable efficiency at Hershey

At Hershey Chocolate Corporation, the dependable, efficient operation of FMC Stokeswrap has been proved day after day for many years. A large battery of these machines is used to pouch-package a wide range of products such as Hershey-ets, candy-coated mint chocolates, milk-chocolate-covered almonds and Hershey Miniatures in both cellophane and heat-sealable paper.

Hershey is one of many well-known food packagers who depend on the proved design of FMC Stokeswrap for maximum production and minimum maintenance. The Stokeswrap handles practically all heat-sealable materials including polyethylene with models for pillow, four-seal and strip packages. Two and four-tube machines are available with pocket, auger, tablet counting, net weight or liquid feed systems offering a high degree of accuracy and a top speed of 240 packages per minute. Electric eye control with constant web tension assures accurate registration. Capacities range upward to 1½ pounds depending on product.



For complete details, write for your copy of Stokeswrap Bulletin P-801.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

FMC Packaging Machinery Division

Stokes & Smith Plant

4914 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

Washington Report

FTC stockpile grows . . . FDA meets rough sledding . . . Convenience foods rated in overseas markets

FDA: Set Back On Ice Cream Rules . . .

New Federal standards for ice cream, which had been scheduled to go into effect Oct. 25, are postponed while the courts take a look. International Assn. of Ice Cream Mfrs. is challenging both the labeling provisions and also the exclusion of whey and skim milk concentrates treated with mild alkalies or salts.

With this important issue now before the Federal Court of Appeals for the District of Columbia, FDA will delay enforcement.

FDA is willing to grant processors more time to use up old boxes and labels, but will press for its proposed ban on the concentrates. Ice cream makers say the concentrates are necessary to adjust acidity and salt balance.

Unless the court throws out the entire FDA order —which seems unlikely—some states are going to have to amend their laws to conform to the new Federal standards.

. . . Outflanked on Mislabel Case

Lever Bros. agreed to drop "3¢ off" and "5¢ off" from its 1- and 3-lb. cans of "new, light Spry." On the surface, it looks like a victory for FDA, which challenged both the price claim (there was no established price, FDA argued, so 3¢ off what?) and the size of the container (14 oz. in a standard 1-lb. container and 2 lb., 10 oz., in a standard 3-lb. container).

But Washington insiders say that Lever's lawyers bargained shrewdly, won an "out" by talking the government into a consent decree. Lawyers both in and out of government privately say FDA could have won its case in a court trial. So, the basic issue—is "cents off" pricing mislabeling? — still waits its first court test by FDA.

FTC: Canners, It's Your Turn, Now.

Canners have until Dec. 31 to reply to a detailed 9-page questionnaire mailed out last month by FTC as part of its economic inquiry into food marketing. Answers supplied by canners could be the basis for lawsuits to break up some companies the FTC thinks have grown too big. At the same time, probe may flush out facts on increasing pricing power of growers' cooperatives.

FTC seeks not only to learn the extent to which some canners also operate in retailing, but also how far back canners are to their sources of supply. For example, canners must tell how much control is exerted over independent suppliers.

Questionnaire, similar to one sent recently to freezers, covers packers of canned fruits, vegetables, and juices, as well as pickles, sauces, baby foods, soups, jams, jellies, and preserves. Canned seafoods and meats are exempt.

Next target: Frozen food distributors.

More Agreement On Automation

Management, labor, and government, despite continued differences, are taking a new look at industry automation. Senate-House Economic Committee reports that three factions are still split on the big question: Is automation causing rising unemployment?

However, they do agree, committee reports, that: 1) Automation causes few direct layoffs. But after a business slump, factories take back fewer workers than they laid off. 2) Automation has not upgraded jobs, as popularly believed. Some skilled workers, for instance, have been forced into unskilled jobs. 3) Expansion in service employment—leisure industries, finance, trade, and government—may take up some of the slack.

Ready Foods Big Hit Overseas

American canned and packaged foods are in brisk demand abroad, government reports. Commerce Dept. recently asked U. S. officials in 30 foreign lands to report on the food wants of the local population. Some of the favorites:

Australia—canned chicken, instant and other coffees, fancy foods, confectionery. **Burma**—soluble coffee powder, popping corn, canned fruits and vegetables, canned meat and meat preparations, condensed and evaporated milk. **Ecuador**—essences for soft drinks. **France**—canned asparagus, preserved fruits, honey. **Greece**—frozen poultry, baby and dietetic foods, canned meat and fish products.

Also, **New Zealand**—vegetable oils, dried fruits and juices, rice, soybeans and soy sauce, catsup (in bulk), glucose, dextrose. **Rhodesia**—coffee, roasted, ground, or mixed; sugar, unrefined. **Saudi Arabia**—frozen goods of all types; canned provisions; grain, rice, wheat, and barley; popcorn. **Sweden**—canned foods, particularly fruits and citrus juices. **Switzerland**—soluble coffee, canned pineapple, mushrooms, frozen chicken, dehydrated vegetables, chewing gum. **Trinidad**—foodstuffs, especially high quality canned and frozen goods; processed meat products.

Old-Age Food Probe Dodders Along

Government study of what oldsters eat moves at snail's pace for want of clerical help. Long-range USDA plans call for series of reports on over-65 group, what they eat, what they'd like to eat, how much they have to spend on food. One objective: What oldsters need in the way of specially-processed items, such as sophisticated varieties of baby-foods.

(Turn Page)

BEHIND THESE DOORS...

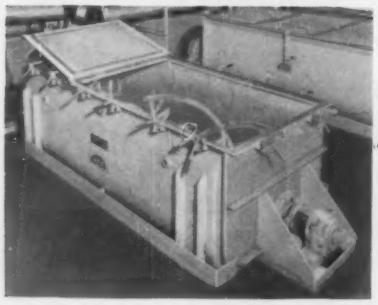
ALL TYPES OF DAY PROCESSING EQUIPMENT!

This is the new, modern plant of The Pillsbury Company, New Albany, Indiana, world's largest producer of refrigerated biscuits and other food products. Here, you'll find DAY equipment at work in practically every department.

In the mixing rooms Day Hercules Mixers are used for making doughs for refrigerated biscuits and other refrigerated bakery products. Day Ribbon Blenders and Day Pony Mixers are used to process the toppings and butters for roll products.

The modern pilot plant located alongside the manufacturing plant carries on experimental work using Day Ro-Ball Sifters, Day Power Screens, Day Ribbon Blenders, Day Pony Mixers, and Day Universal Mixers.

When *you* select DAY, you choose equipment that is proved and praised in hundreds of the nation's leading food processing plants. Consult DAY on your processing equipment requirements. Use the modern, extensive J. H. Day Co. laboratory facilities to test your products. There is no obligation.



The J. H. DAY Co.
Division of The Cleveland Automatic Machine Co.
4924 BEECH ST., CINCINNATI 12, OHIO

QUALITY MIXING, BLENDING, MILLING AND SIFTING EQUIPMENT SINCE 1887

DAY

More Price Suits Coming

You can expect a sharp rise in the number of suits attacking food pricing practices if FTC wins the 50% bigger budget it will ask for in the new fiscal year. This year Congress gave the commission $7.5 million, substantially higher than the $6.8 million alloted in the previous 12-mos. period. Almost all of the extra money is being spent to ferret out illegal pricing, such as advertising allowances made only to certain customers.

FTC will tell the new Congress: We caught an eye-opening number of sinners on just a little more investigating money; just think what we can do with 50% more money!

Outlook: FTC will get some, but not all, of the extra money being asked. A new budget of about $10 million vs. this year's $7.5 million is entirely possible. Commission says it now has enough data—much of it supplied by food brokers and processors themselves—to keep up a drum-fire of charges for many months to come.

BRIEFS

Lifting of acreage restrictions on domestic sugar beets means an extra 300,000 tons of supplies, U. S. Beet Sugar Assn. predicts. Output would be between 2.6- and 2.7-mill. tons.

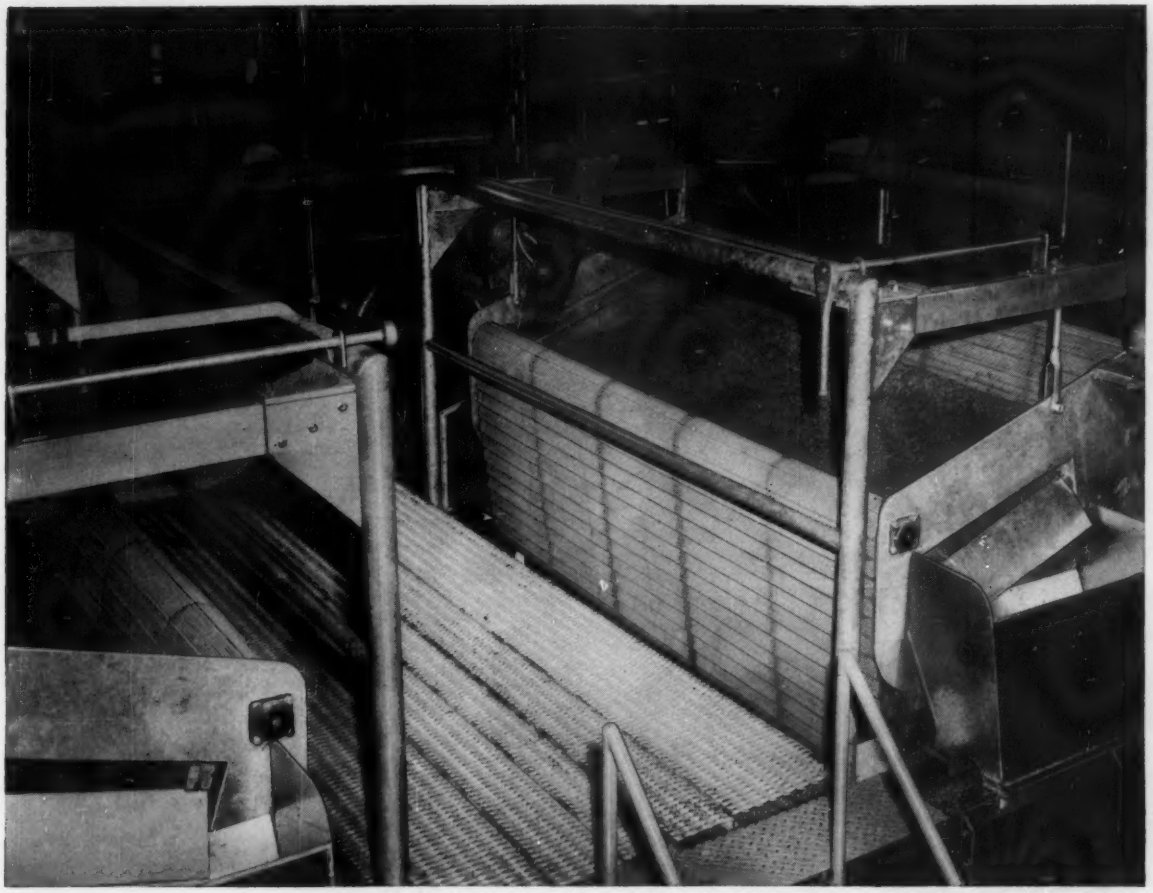
Inspection service for foods containing meat or meat products is now available from USDA. Step will help processors who sell to markets requiring inspection stamp.

Higher freight rates on rail hauls, ranging up to 1¢/cwt., went into effect Oct. 24. Maximum increase for fresh fruits and vegetables is $2 per car.

Quality comparison between U. S. canned fruits and juices and British and West Europe varieties will be made by USDA team in London starting Jan. 1. Report will be released late Spring.

If you have an unresolved tax dispute, check Internal Revenue Service for its new plan. Idea is to settle differences via informal conference instead of through time-consuming court appeals.

Diplomats are being schooled to give U. S. firms better help on what's needed to distribute their products in overseas markets.



"We dry our vegetables 84% faster on USS Cyclone Conveyor Belts"

"Our USS Cyclone belt dryer does in one hour what conventional tray dryers do in six," says Mr. W. B. Bannon, vice-president, California Vegetable Concentrates, Inc., Modesto, California. "Each machine removes 1000 to 1200 pounds of water from our vegetables every hour – without handling, loading and unloading individual trays.

"Our first Cyclone dryer belt is still giving us good service after five years. Two seasons after we put it in, we purchased five more—also going strong. These six belts handle approximately 50% of the products produced in one of our Modesto Plants. The principal advantages of the belt dryer are: rapid and uniform drying, deeper color, and reduction of total bacteria count."

Your plant can earn larger profits in a shorter time with a USS Cyclone Conveyor Belt. The belts are flexible, porous and sanitary. Cyclone Conveyor Belts can be fabricated from any ductile metal suitable for your processing operation from sub-zero freezing through the high temperature range, whichever the operation may require. Send for our free booklet today.

USS and Cyclone are registered trademarks

This mark tells you a product is made of modern, dependable Steel.

American Steel & Wire Division of United States Steel

Cyclone sales offices coast to coast

American Steel & Wire
Dept. 0439, 614 Superior Ave., N.W.
Cleveland 13, Ohio

Please send me your free booklet on USS Cyclone Conveyor Belts.

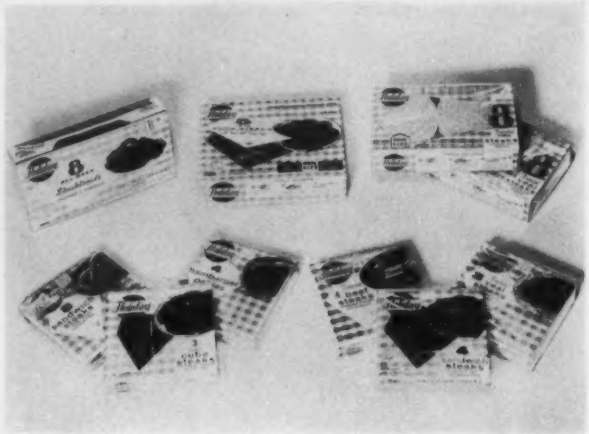
Name_____

Address_____

City_____ Zone_____ State_____

new packages & products

UNSALTED MARGARINE



DIE-CUT MEAT CARTON

POLY-BAGGED CLAMS

FLEISCHMANN UNVEILS FIRST UNSALTED MARGARINE

Just introduced is Fleischmann's sweet (unsalted) margarine made of liquid corn oil and partially hydrogenated corn oil, providing a good source of poly-unsaturated fatty acids.

The product is fresh frozen to capture its ingredient flavors, and is unsalted for those on a salt-free diet. Other features are good spreadability and high cooking-baking qualities.

Available in 1-lb. packages of 4 quarters each, the margarine is packaged in bright green foil outerwrap and silver embossed foil innerwraps.

FROZEN CLAMS DEBUT IN POLY BAGS

Olympia Oyster Co., Shelton, Wash., has switched to sturdy, custom polyethylene film to merchandise Washington Little Neck Clams.

Clams, frozen in the shell, can be removed individually without defrosting the entire 3-lb. package.

Bags, hand-loaded and hand-sealed, are 7¼ x 13-in., 3-mil polyethylene flexographically printed on both sides in blue, green, orange and white.

The Dobeckmun Co. is bag supplier. (401)

SWITCH FROZEN MEATS TO DIE-CUT CARTONS

Latest innovation in Holiday Frosted Food Co.'s family of frozen meats is a change to die-cut cartons overwrapped in cellophane.

Window package gives the shopper a chance to check for herself the quality of meat contents, which she often judges by color. Hidden products often make her suspicious.

Wrap is Avisco 300 MSB-7 cellophane (402); carton is produced by E. J. Schoettle Co. (403)

BORDEN GOES TO LAMINATE FOR CREAM CHEESE LINE

Laminated wraps have replaced transparent wrappers for Borden's nationally distributed line of 6-oz. cream cheese bars.

Klingseal wrap, designed and flexographically printed in four colors and a protective lacquer by Milprint, Inc., is a combination of microcrystalan waxes that, when matched with foil outer layer, shut air out and lock moisture, freshness, and flavor in.

Borden believes new wrap "enhances shelf life and freshness." (404)

LAMINATED CHEESE WRAPS

MOISTURE-PROOF SYRUP BAGS

3-CAN SOFT DRINK JACKET

BAG MOISTURE-PROOFS DEHYDRATED SYRUPS

Dehydrated syrup mixes from Reddi-Mix Products, Bronx, N. Y., are now being marketed in moisture-proof bags.

Instant Syrup-Pak has foil mounted to 60-lb. kraft to insure dryness and repel ultraviolet rays. A wax-laminated bleached, glassine inner-ply provides additional contents protection and a heat-seal band accomplishes positive closure.

Arkell and Smiths cooperated in the bag's design and development. (405)

PACK SOFT DRINKS IN 3-CAN JACKET

On their way to market throughout Canada are 3-can multipacks of California Orange soft drinks from Nesbitt Fruit Products, Ltd., Ottawa.

Officials chose trio-jacket over six unit package because price of non-returnable 6-can pack would appear prohibitively high compared to the net cost of the returnable 6-bottle carrier. Relative newness of cans to Canadian market prompted need to attract experimental purchases.

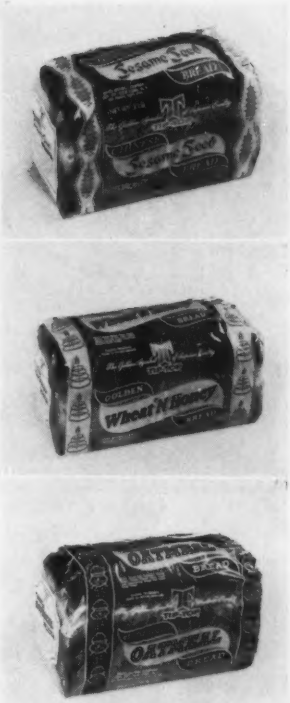
Cans, jackets, and canning equipment are supplied by Gair Div. of Continental Can Co. (406)

MARKET NEW LINE OF PREMIUM BREADS

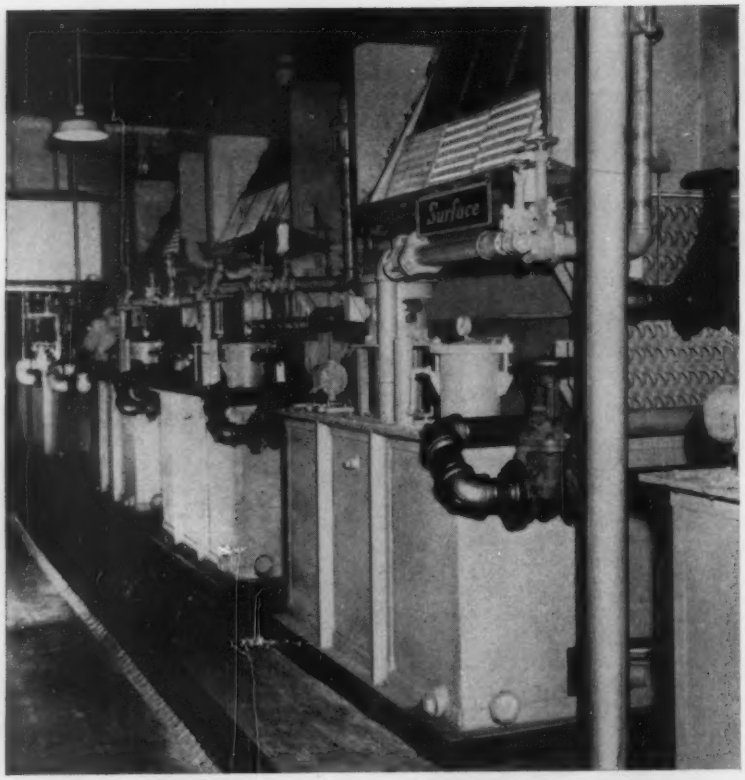
To meet growing consumer demand for new and different variety foods, Ward Baking Co. has developed a premium line of breads to be marketed under the Golden Split "T," a modification of Ward's Split "T" trademark.

Chinese Sesame Seed, Wheat 'N Honey, and Kettle-Cooked Oatmeal Bread are first varieties to be test-marketed. Each is a 1-lb. loaf attractively packaged in printed polymer-coated cellophane for maximum protection and impulse appeal.

(continued on next page)



PREMIUM BREAD LINE



120 GRAINS CUT TO 45 IN 200,000 cfm OF AIR WITH 85° TOWER WATER

Without Kathabar, this job would have taken 1800 tons of refrigeration, at about 35F and reheating air from about 45F to 98F! With Kathabar the job took 63 hp instead of 2000. Ask the men who have seen Kathabar Type C units serve for years with practically no maintenance. Write for specific information.

Surface

SURFACE COMBUSTION

Division of Midland-Ross Corporation

2382 Dorr St., Toledo 1, Ohio

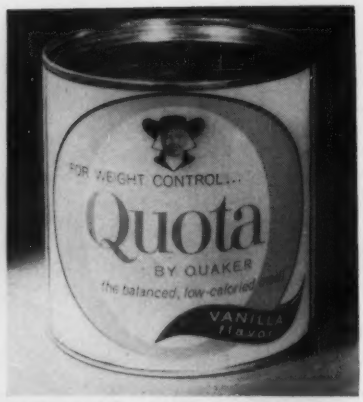
Send facts on Kathabar systems for the following application:

name and title.....

company.....

street.....

city.....*zone*.....*state*.....



"QUOTA," a balanced, low-calorie meal in a glass, has been introduced in Chicago and Minneapolis sales territories of The Quaker Oats Co.

Packaging Briefs

Lightweight pickle jar, aimed at lower freight costs, less shelf space, and more label facings, has been introduced by Armstrong Cork Co. (407)

Low-cost transparent plastic film, Visolyte, has been introduced to packaging market by Visking Co., Div. of Union Carbide Corp. (408)

New Bacon Packaging Film, Vitafilm 75WNF-1, has been developed by Goodyear. Film is priced as much as 56% under competitive wraps and boasts exceptional clarity and non-fogging features. (409)

New family of cellophanes, designated V-401 and V-402, comes from Packaging Div. of Olin Mathieson Chemical Corp. Polymer-coated films, providing strong seals at low temperatures, are particularly recommended for moist products distributed in dry climates and dry products sold in humid climates. (410)

New Product Shorts

"Custom-Cut" portions, natural fillet shapes nestled into a new 11⅛ x 5¼-in. carton, have been introduced by Blue Water Seafoods.

Frozen Baked Beans & Frankforts from Howard Johnson's will be available in local supermarkets and independent grocers.

Canned Mushroom Gravy will be marketed in Campbell Soup Co.'s Franco-American line.

Peanut Clusters, Cocoanut Logs, and **Peanut Butter Pillows** are three new packages featured in Stephen F. Whitman & Son's fall line of Self-Service candy items.

Packaging materials that protect...while they save...while they sell

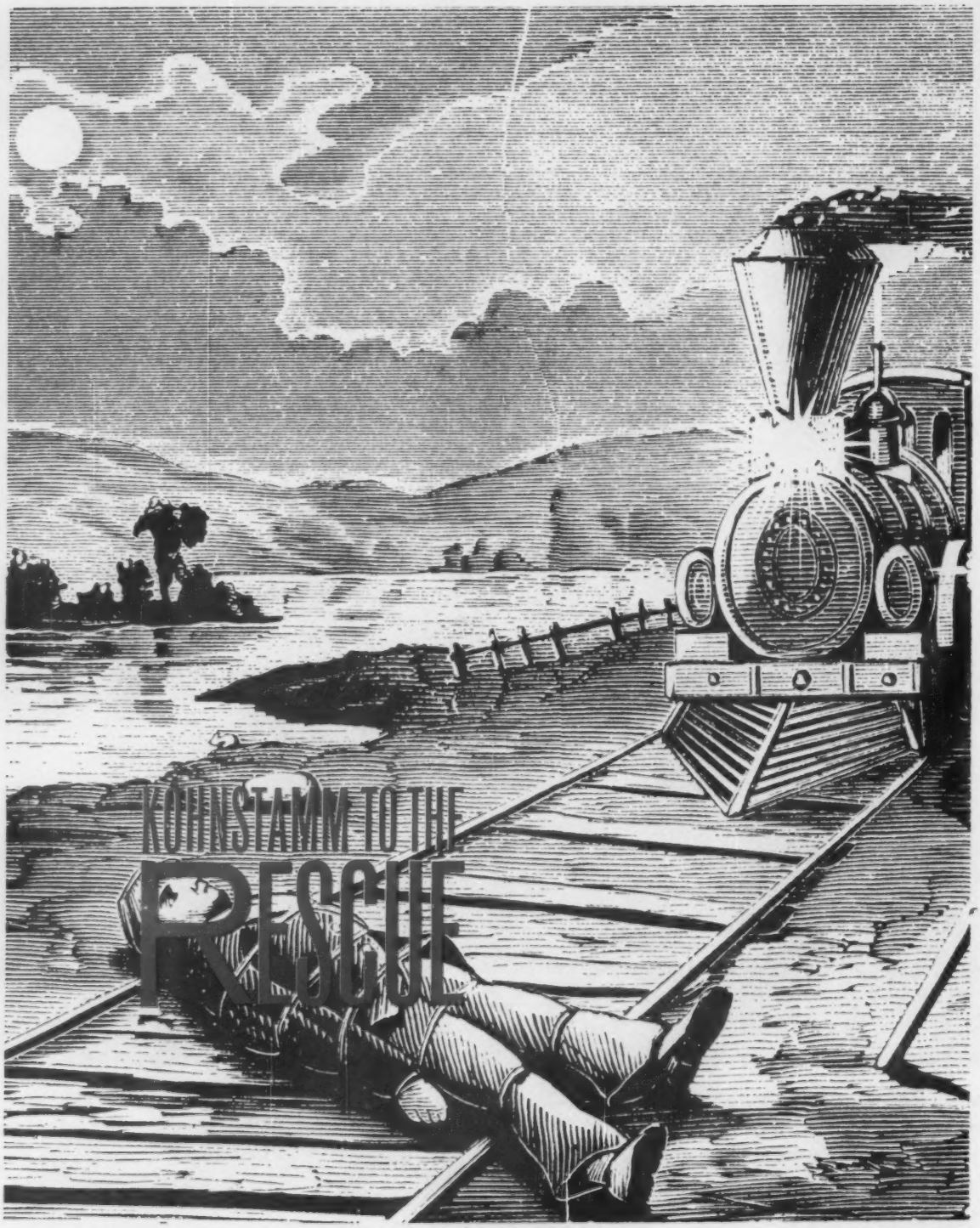
IN INSTANT POTATOES

All five of the leading makers of instant potatoes use Riegel protective packaging materials *regularly*. A good sign that their many years of personal experience have led them to rely on Riegel's technical leadership . . . on Riegel's ability to tailor-make paper to suit the product. Many other sales leaders also feel this confidence. A good reason for you to talk to Riegel too?

5 OUT OF 5 BUY Riegel

Riegel offers you more than 600 different packaging materials . . . assurance that you can achieve the right combination of product protection, machine efficiency and low cost. Pouch papers, paperboards, glassines, foils, films . . . laminated in various combinations . . . plastic-coated or waxed . . . printed or plain. Write to Riegel Paper Corporation, 260 Madison Ave., New York 16, N. Y.

CIRCLE 31 ON READER SERVICE CARD 31



WHEN COLOR OR FLAVOR DIFFICULTIES ARE THE VILLAIN, H.KOHNSTAMM IS THE HERO.
WE HAVE WORKED OUT HAPPY ENDINGS TO THIS STORY FOR OVER 100 YEARS.

H. KOHNSTAMM & CO., INC.

SINCE 1851

First producers of certified colors. **161 Avenue of the Americas, New York 13; 11-13 E. Illinois St., Chicago 11; 2632 E. 54 St., Huntington Park, Calif.**

More Than Meets Eye in FTC Questionnaire

First the freezers, then the canners, are ordered to reveal all to the Federal Trade Commission. Through a long, detailed questionnaire, FTC asks the processors to tell it more about their businesses than many know themselves.

These "economic inquiries into food marketing" cannot be ignored, however. Processors are required by law to answer by a specified date. And canners who also are freezers must fill out both questionnaires.

In many small companies, only the president has enough knowledge of his operations to satisfy FTC's thirst for information. In some firms, no one—not even the top executive—has records of everything that FTC wants.

Answering questionnaire costly task

In any case, a great many expensive manhours will go into answering each questionnaire. For the industry as a whole, the cost of handling in terms of time and money will represent a tremendous figure.

And what to do if you haven't the data to complete the forms as legally required? Take a tip from National Canners Association. Write FTC a polite note advising them that you can't tell all because you don't know all. You better be able to back up your contention, of course.

Just why is this government enforcement agency collecting "economic data"? To quote the agency itself: "The questionnaire seeks information on how canners have been affected by current trends toward concentration and integration in the food industry."

Processors could indict themselves

This undoubtedly is true as far as it goes. More than likely, FTC also wants information to fill the holes in the earlier—not too successful—probe of retail food chains and their practices. And it probably is asking questions of canners to see if their answers match those of distributors.

There is no doubt that FTC is interested in the concentration of power developed through mergers of food manufacturers and through integration backwards to form processor-farmer cooperatives.

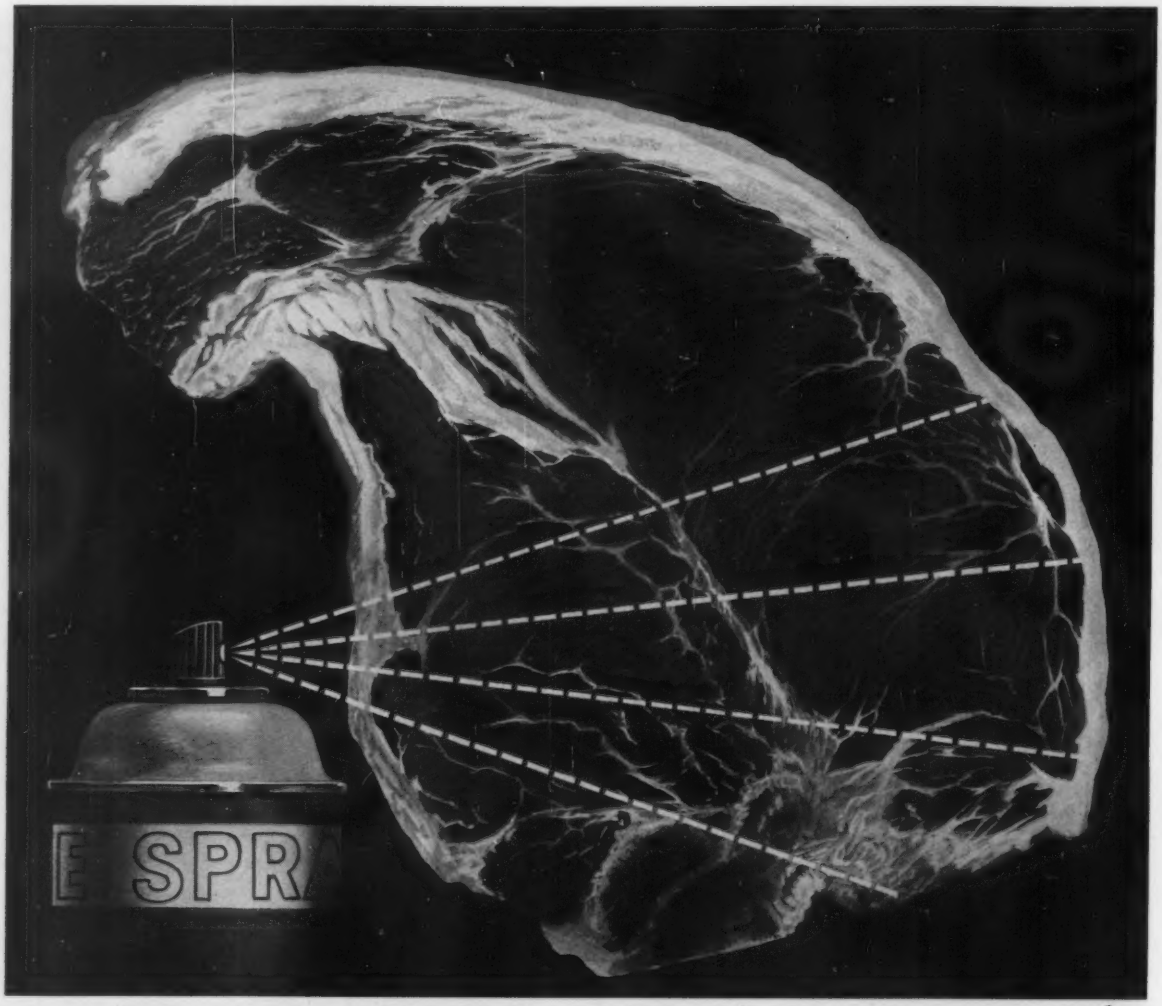
Trade practices, of course, must be spelled out in the questionnaire for FTC's particular pleasure. In fact, you could conclude that the government is asking food processors to indict themselves if they be guilty of "unfair" practices.

So FTC's purpose can be restated this way: "The questionnaires seek information on how canners and freezers have participated in integration trends and undesirable trade practices in the industry.

If the freezer and canner probes hit pay dirt for FTC, who's next?

Other branches of the industry better get ready to tell all.

Or get all ready to tell!



RHOZYME for tailored meat tenderizers

Here's your chance to get off to a good start in the new field of aerosol-packaged meat tenderizers . . . by using RHOZYME proteolytic enzymes, of microbiological origin. Unlike similar products derived from other sources, RHOZYME enzymes can be manufactured to a variety of specifications. They are adaptable to both liquid and powdered meat tenderizers. Basic formulations for both types are now available from our laboratories. The liquid tenderizers are "naturals" for packaging in spray dispensers . . . for convenient, logical, economical application. And since the use of aerosol cans in food marketing is a novelty, tenderizers sold in such containers should enjoy an excellent sales position on retail shelves.

The action of RHOZYME enzymes is also valuable in processing many other protein-containing materials. Examples include: modifying whey protein for cheese spreads; improving the baking characteristics of bread, crackers, cookies, pretzels; producing protein hydrolyzates for diet foods, breakfast cereals, pharmaceuticals; and converting protein wastes (e.g. fish solubles) to animal feeds. Write to Dept. SP-26 for useful suggestions on the use of these enzymes.

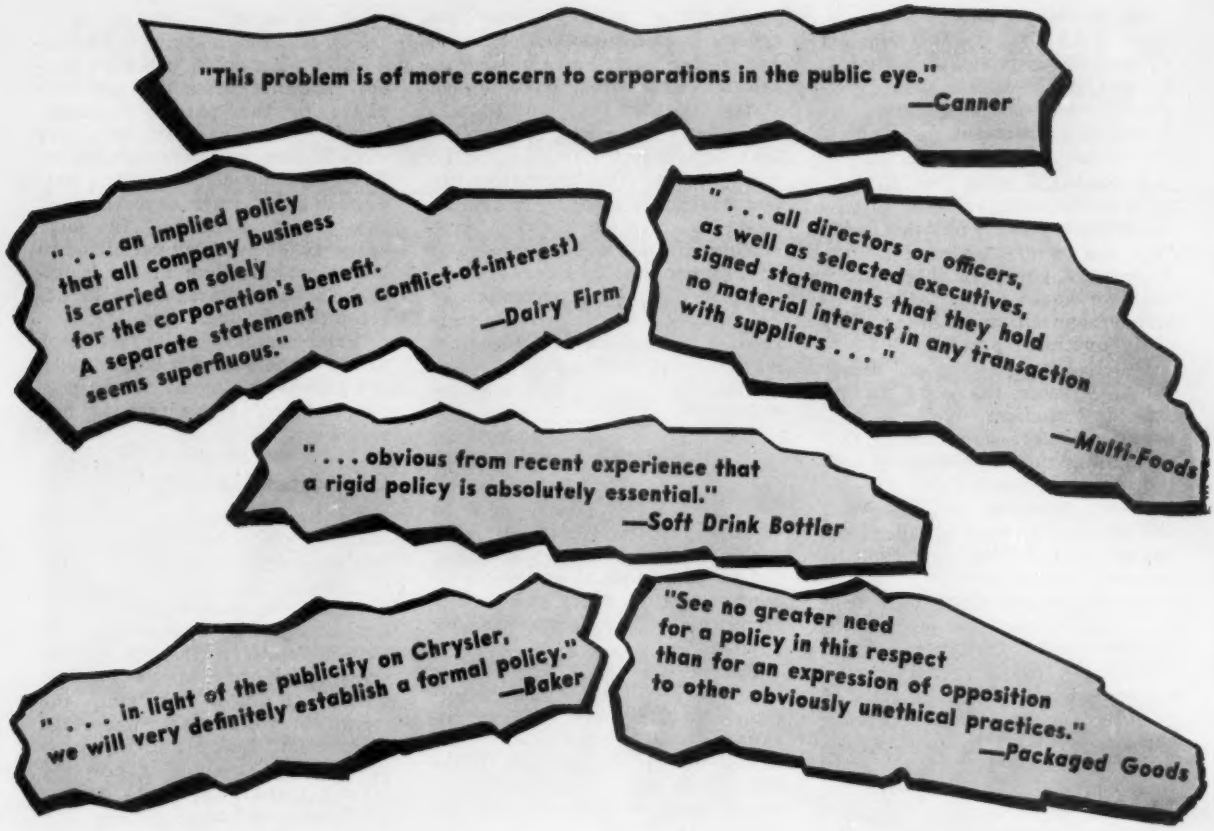
RHOZYME is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

RHOZYME


"This problem is of more concern to corporations in the public eye."
—Canner
". . . an implied policy that all company business is carried on solely for the corporation's benefit. A separate statement (on conflict-of-interest) seems superfluous."
—Dairy Firm
". . . all directors or officers, as well as selected executives, signed statements that they hold no material interest in any transaction with suppliers . . ."
—Multi-Foods
". . . obvious from recent experience that a rigid policy is absolutely essential."
—Soft Drink Bottler
". . . in light of the publicity on Chrysler, we will very definitely establish a formal policy."
—Baker
"See no greater need for a policy in this respect than for an expression of opposition to other obviously unethical practices."
—Packaged Goods

No 'Payola' Worries—Yet!

Most food companies don't see any conflict-of-interest problems between purchasing officers and suppliers. But some bigger outfits will take second look. . . . Sharper questioning by stockholders, SEC may force policy review

FINANCIAL TIES that could influence a buying official's purchasing policies are not a significant problem to food-beverage firms at present. That's the word from over 20 industry executives polled last month by FOOD ENGINEERING.

A big majority of the officials felt "it can't happen here" when asked about Chrysler's action in firing President William C. Newberg on charges of profiting from financial ties with supplier firms. However, larger-sized outfits showed more awareness that, possibly, formal guide-lines should be spelled out to eliminate gray areas. Smaller firms, for the most part, felt the pickings were too slim to make the problem a significant one.

Of the 22 company presidents checked by FE, nine said they had some sort of a formal policy covering relations between corporate officers and purchasing officials and suppliers. And of the remaining 13 who saw no need for such a policy, three said that the Chrysler affair is making them reconsider the need for one.

That even more companies may be forced to review the problem in the future is indicated by growing interest in it from two other areas —shareholders who have raised the point at annual meetings, and the Securities & Exchange Commission (watchdog of corporation financial reports). SEC spokesmen indicated to FE's Washington Bureau that financial statements will be scrutinized more closely.

Among the bigger firms (with sales over the $100 million level) just over half of them told FE they had a written policy currently. However, smaller firms rejected such formal guide lines by a better than two-to-one margin.

Outfits who didn't feel the need to spell out policy argued that competitive bidding, auditing controls, and plain business ethics were adequate safeguards. One big dairy put it this way: "There is certainly an implied policy that all company business is carried on solely for the corporation's benefit. It is unlikely that a conflict-of-interest could escape detection because of our strict operating controls as well as the checks exer-

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

cised both by internal auditors and certified public accountants. Ethical considerations should govern all business transactions, and a separate statement on conflict-of-interest seems superfluous."

A packaged goods outfit, who feels an individual's sense of values is the key to the problem, said: "We see no greater need for expressing a policy in this respect than we would see for an expression of opposition to other obviously unethical practices."

Others favor a more direct route. Witness the comment by this meat packer: "We have had, for many years, a policy of discouraging any supervisory employees from having any outside interest, financial or otherwise. It's our goal to keep all such personnel contributing full time to company operations."

At least one big-volume firm said the Newberg case had inspired second thoughts on the problem. A baked goods concern acknowledged that "in the light of the Chrysler case we are studying the matter and will definitely establish a formal policy. We're sure this won't differ from the policy in effect the past several years which has been one mainly of understanding on these matters."

Some firms conceded that basic purchasing policies may have to be updated with additional details to cover the conflict-of-interest area. Typical of that group is Minute Maid, which reported its experience as follows: "Last year we issued a general policy letter covering the purchase function and outlining its function and scope, basic responsibilities, and objectives. This statement indicated that additional policy letters would be issued from time to time covering purchasing policies, organization, and other aspects.

"For about a year, we've been considering various problems of a policy nature in the purchasing area. When all of these policies are finally formulated, they will include a statement of company policy with regard to such problems as conflict-of-interest."

Share Owners Speak Up

Pointed questions about financial ties between buyers and sellers have already bubbled up at the annual meeting of some food firms. General Foods and General Mills shareholders were told that their companies had tackled the problem long ago.

GF Chairman Charles G. Mortimer reported that "All directors and officers, as well as a number of selected executives, have signed statements that they hold no material interest in any transaction with suppliers." Furthermore, he pointed out, the company has two additional safeguards against financial collusion between purchasing officials and suppliers: 1) Procedures used by internal auditors and outside accountants, and 2) company stress on multiple sources of supply of all principal materials as well as competitive bidding on all major building contracts.

GM shareholders were told by Chairman C. S. Kennedy "that "every company officer and department head, who has anything to do with purchasing, was asked to furnish information as to whether or not he had material ownership or control of any agency or company from which GM bought services or supplies."

Among the small firms, there was the feeling that conflict-of-interest was no serious threat because the "stakes are smaller than in the bigger companies." Or, as one canner put it: "This is a matter of concern for those corporations in the public eye."

However, even here there were some staunch supporters for a formal policy.

A soft drink bottler declared, "Our company has always had a rigid policy prohibiting financial interests in supplying firms by either executives or purchasing officials. It is obvious from recent experience that such a policy is absolutely essential."

Problem Is Tricky

Some companies confessed that the problem is a tricky one—that it's hard to draw a line at where an otherwise normal investment could become a "corrupting" influence.

Thus, a maker of specialty foods said that, "If any of our officers or purchasing employees were becoming **heavily financially interested** in any of our suppliers, we would definitely insist that they divest themselves of such holdings." On the other hand, a packaged goods firm said, "No officials may have a financial interest in supplying firms **other than a nominal investment** interest for investment purposes in firms listed on major stock exchanges."

Then, too, there may be unusual internal set-ups which add a new wrinkle to the problem.

For example, a Midwest respondent said his outfit "operates several 'satellite' firms that are suppliers to the parent company. Some of their executives are stockholders in these companies. The operating officers of the 'satellites' are former executives of the parent company. In some cases, they have been permitted to become stockholders in the 'satellite' as an encouragement to develop the new operation.

"Inter-company sales are kept pretty much at arm's length, with the purchasing agent of the parent company being free to buy elsewhere."

Government Looking In

For the most part, the SEC feels that the conflict-of-interest problem can be handled by strong enforcement of present laws that require all corporations to file semi-annual financial statements with the SEC. In addition, publicly owned firms are required to report within 10 days following the month in which "any important transaction" took place. Big question here, of course, is how big must a transaction be to become an "important" one.

"Maybe a good deal of information should be supplied in the financial statements and maybe it is not being supplied," an SEC spokesman declared. "If we decide this is the case, we are going after corporations and require them to make detailed disclosures with regard to financial interests by executives."

It's possible that SEC may issue new administrative rules governing disclosures of financial interests, such as fixing the limits under which transactions are exempt.

There is also the possibility that SEC may take a closer look at financial past statements and send them back for more information.

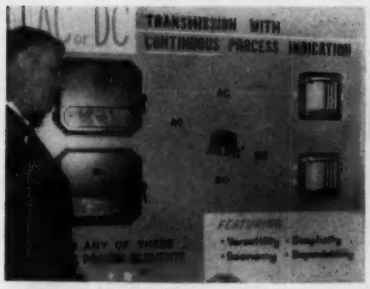
On another front, United Shareholders of America, 800-member stockholder group, queried 1,500 companies listed on the New York and American Stock Exchanges as to their purchasing and conflict-of-interest policies.

Among those replying were Gerber Products. Said Pres. Daniel F. Gerber: "I believe that the (Chrysler) affair . . . has had a very good effect on a lot of companies in making them a little more alert to the possibility of any remotely similar situations that might exist in their own organizations." (End)

PROCESSORS EYE LATEST CONTROLS

Advanced transmitters, process monitors, inspection units, flow meters, and lab instruments on display at ISA exhibit

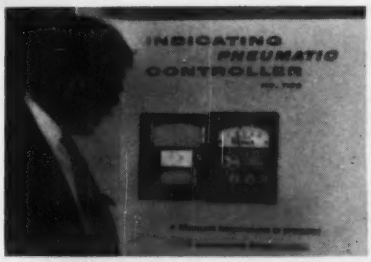
INDICATING TRANSMITTERS, CONTROLLERS



ELECTRONIC UNIT combines a.c. or d.c. signal transmission with continuous process indication. Ranges: Temperature, —400 to 1,200F.; pressure, 30-in. vacuum to 20,000 psi.—Taylor Instrument Cos., Rochester, N. Y. (451)

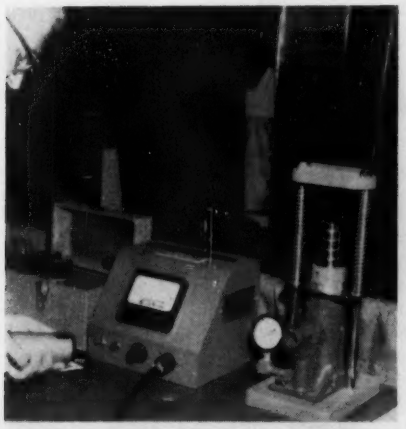
TRANSMITTING ROTAMETER sends air signal proportional to fluid flow rate to remote recorders, controllers, etc.—Schutte and Koerting Co., Cornwells Heights, Pa. (452)

PNEUMATIC indicating controller employs position-balance system for precise monitoring of pressure, flow, liquid level, temperature, and humidity—Bristol Co., Waterbury, Conn. (453)

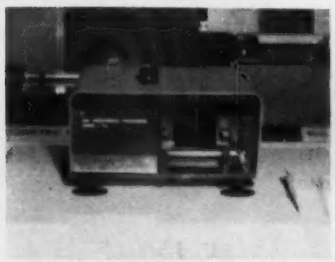


INDICATING pneumatic controller features proportional action (0.5-100%), optional reset, compensated thermal system. — Robertshaw-Fulton Controls Co., Knoxville, Tenn. (454)

LABORATORY UNITS



ELECTRONIC MOISTURE METER — for granular, powdered, or loose materials—gives highly accurate 1-min. test. Hydraulic pressure assures sample homogeneity.—Moisture Register Co., Alhambra, Calif. (455)



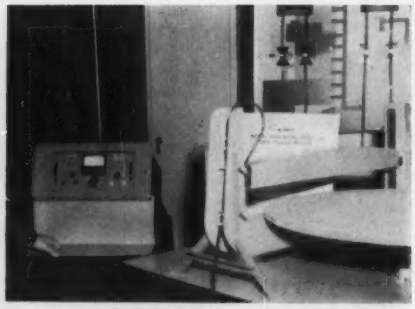
PYCNOMETER rapidly gages volume, density, and porosity of irregular, powdered, or porous solids. Accuracy: 0.1 cc.; sample volume, 50 cc. —Beckman Instruments Div., Fullerton, Calif. (456)

DIGITAL - READOUT refractometer, accurate to 0.1%, takes 1.5-cc. sample, covers range 0.0005-0.2 unit.—Waters Associates, Framingham, Mass. (457)

For more information, circle key numbers on Reader Service Card, back of book

CONTAINER-FILL CONTROLS, using gamma-energy source and detector, gage liquid level within 1/64 in. at line speeds to 1,000 per min. Left: Inspection-rejection system detects either slack-fills or overfills, actuates reject mechanism. (458). Right: Feedback unit senses variation from preset film, sends correcting signal to filler.—Industrial Nucleonics Corp., Columbus, Ohio. (459)

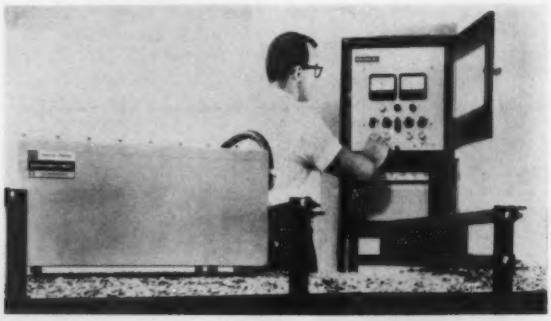
INSPECTION DEVICES



METAL DETECTOR spots ferrous and nonferrous particles in material conveyed at speeds to 100 fpm. Self-balancing minimizes readjustment.—Electro-Mechanical Research, Inc., Sarasota, Fla. (460)

IN-STREAM MONITORS

PRODUCTION-LINE VISCOMETER continuously gages product consistency at temperatures to 550F., line pressure to 150 psi.—Brookfield Engineering Laboratories, Inc., Stoughton, Mass. (461)



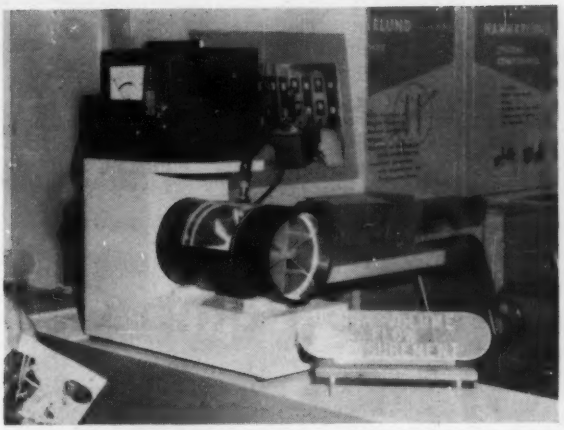
GAMMA-RAY GAGE, using neutron reflection, measures and records moisture content of conveyed solids.—Nuclear-Chicago Corp., Des Plaines, Ill. (463)

CLOSED-CIRCUIT TV enables continuous surveillance of process lines, conveyor systems, warehouses, and loading docks.—Cohu Electronics, Inc., San Diego, Calif. (462)

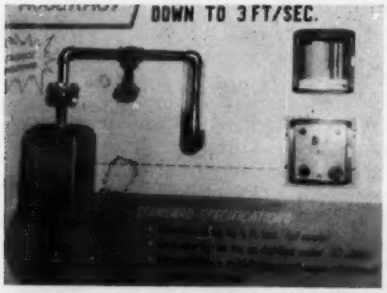
For more information, circle key numbers on Reader Service Card, back of book

BOILER-LEVEL CONTROL transmits motion through pressure-tight wall with curved tube containing pre-stressed spring wire. Eliminates bellows, magnets, etc.—Yarnall-Waring Co., Chestnut Hill, Pa. (464)

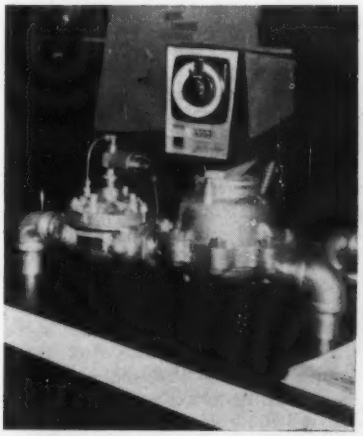
FLOW METERS, LIQUID LEVEL



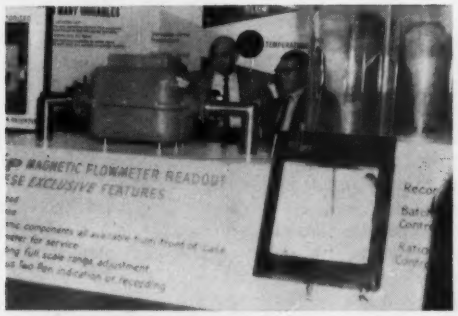
PIPELINE METER'S turbine signals remote recorders and totalizers. Accuracy: 1% of range. Easily installed, cleaned, and maintained, units are mounted directly in 2-8 in. dia. lines.—Halliburton Co., Duncan, Okla. (465)



MAGNETIC flow meter eliminates line obstruction, is unaffected by product density, viscosity, etc. Accuracy: ½% of full scale down to 3 ft./sec.—Taylor Instrument Cos., Rochester, N. Y. (466)

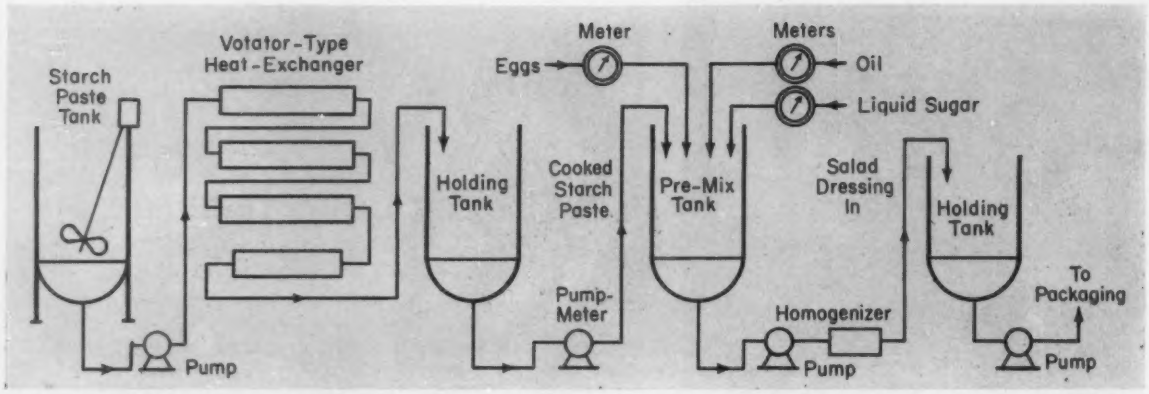


PUSHBUTTON UNIT offers unattended control of liquid batching and blending. Operator merely sets pointer for desired delivery. Meter shuts flow automatically, resets pointer.—Buffalo Meter Co., Buffalo, N. Y. (467)



NEW READOUT for magnetic flow meter uses transistorized circuitry for greater sensitivity, flexibility. Flow value equivalents range 1-30 ft./sec. as full scale.—Fischer & Porter Co., Warminster, Pa. (468)

For more information, circle key numbers on Reader Service Card, back of book



ADVANCED SALAD DRESSING LINE turns out 1,200 gal./hr. New pump-meter installation assures on-the-button formulation accuracies and uniform products.

Unique Pump Controls Metered Flow

Accuracy counts in proportioning difficult-to-handle starch paste during salad dressing making. Midwest dressing manufacturer gets precision plus better product uniformity with a sanitary meter-pump

IT'S NOT EASY to transfer and measure viscous-type ingredients with a high degree of accuracy—say with 0.5%. Especially if you're pumping and measuring starch paste into tanks used for blending salad dressing. But J. L. Read Foods, Inc., has a clever system at its Streator, Ill., dressing plant. It's a new sanitary, meter-type pump (Waukesha-Emulsol) that simultaneously transfers and measures fluid and semi-fluid ingredients with an accuracy of ± 0.5%. At Read, this pump is automatically measuring starch paste at the same time it's transferring it from any of three 200-gal stainless steel holding tanks and into a battery of 100-gal. pre-mix tanks.

System Pays Off

With this set-up at Read, the following advantages are gained:

. . . **Increased accuracy in starch paste measurement.** In the past (even in well-mechanized plants), starch paste was measured with tank-mounted liquid-level gauges. Inaccuracies resulted because paste level had to be gauged by eye. In most commonly used 3½ to 4-ft. dia. holding tanks, a ¼-in. level inaccuracy would amount to variations of several gallons. This would add up in batch-after-batch of production during the course of a day. Hence, variations in the amount of starch paste introduced into pre-mixers result in inaccurate formulations, which are not likely to meet the Federal Standards of Identity that call for minimum oil (30%) and egg (4%) contents in salad dressing.

Such costly sub-standard product-discrepancies aren't possible when the automatic measuring pump is locked into the pumping stream. Each measurement reaches a pre-mix tank in quantities that vary no more than 0.5% from the pre-set amount.

. . . **Less production-time losses.** The new Waukesha pump draws and meters starch paste directly into mixers, thus abolishing manual gauging of product level. Attendant's work is simpler and more pleasant, frees him for other duties. Morever, the speed (600 gal./hr.) of the in-stream measuring-type pump steps up output. Once the amount of starch paste has been pre-set, the pump just keeps on feeding the called-for gallonage into a pre-mixer. And, as in some dressing plants, time-consuming weighing devices are eliminated.

. . . **Improved sanitation.** It comes from specially designed features that permit ready sanitation. Trouble with this paste is its cohesiveness — a property that makes flushing difficult and thus requires disassembling the pump for brush-cleaning of parts. New pump has stainless steel product-contacting parts. Too, this easy to disassemble-reassemble pump is of double-O-ring construction and without gaskets.

. . . **Less manual handling.** Once the desired amount of paste has been pre-set, operator simply jabs a pushbutton. Pump then takes over, delivering the called-for amount of paste. System's designed to start and stop delivery any number of times during the pre-set cycle. At completion of the cycle (independent of number of stops), pumping immediately ceases.

JOHN V. ZIEMBA
Senior Associate Editor, "Food Engineering"

New Pump-Meter

Basically, Read's new pump comprises: (1) a 1½-hp. motor; (2) front (discharge) and rear (pump) heads; (3) two sets of rubber impellers (for front and rear heads) on a single drive shaft; and (4) an rpm. counter (Cyclo-Motor) that's chain-driven to a sprocket fixed to the motor shaft.

Unique about this double-headed pump is its internal by-pass system that eliminates problems of measurement discrepancies due to wear and subsequent slippage in pumping chamber (rear front to rear heads) arrangement. Pressure in forward head is always balanced. Consequently, the amount of starch paste transferred is always the same.

Metered flow control is achieved by the counter that totalizes number of pump revolutions (each revolution delivering a precise amount of paste). Upon completion of its pre-set cycle, counter automatically cuts off a microswitch. Unit is immediately ready for start-up, without any action other than actuation of the switch.

Another feature: If impeller starts wearing, less paste is by-passed into the front head which, however, holds more than the rear head can take.

Potential Applications

Through the combined efforts of Emulsol Equipment, Inc., and Pump Div. of Waukesha Foundry Co., this new positive displacement pump had first been tested and proven in the manufacture of salad dressing. It may be used to assure measuring accuracy in other branches of the food industry, giving metered flow control with fluid and semi-fluid products of widely varying viscosities and physical characteristics.

Emulsol's president, Mel Lipschultz, sees such potential sanitary metering applications as:

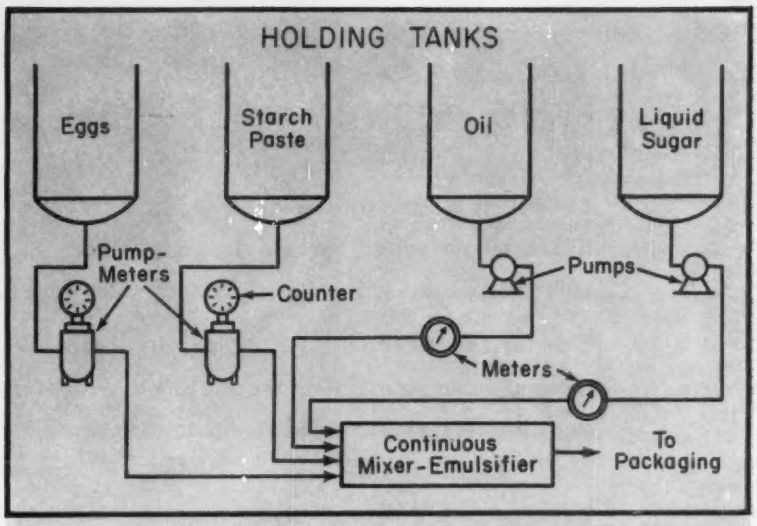
. . . **Timed pushbutton-filling of liquid egg products** (whites, yolks and whole eggs) from a holding tank and into 30-lb. containers and 55-gal. drums. Get greater accuracies than through conventional use of weighing devices and manual opening and closing of tank's discharge valve. Similarly, products like shortening, edible oils, syrups, peanut-butter, etc. that don't lend themselves to conventional packaging could be bulk-packed.

. . . **Transferring in process viscous products** which require metering such as tomato paste, fruit juice concentrates, relish for dressing manufacture, etc.

. . . **Metering ingredients** like milk, syrup, eggs, etc. in and out of bulk tank trucks or RR cars to assure accurate inventories.

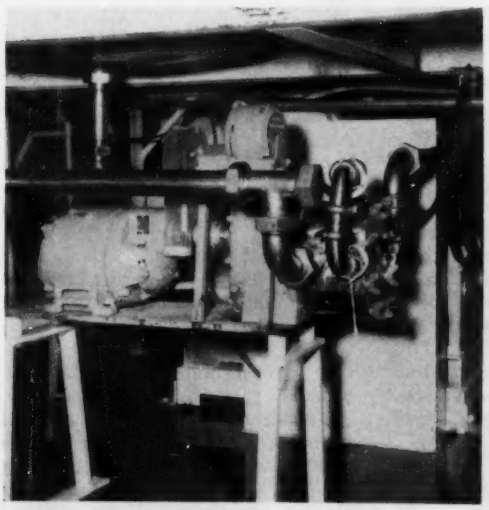
. . . **Transfer-metering of doughs** and cake batters in the production of baked goods.

. . . **Proportioning (in process)** a variety of other products like liquid chocolate and starch slurries (for candy making), meat emulsions (sausage production), sauces for potato salad, ice cream, etc. (End)



On Way to Automation

With the problem of pump-metering difficult-to-handle starch paste solved, Emulsol's Lipshultz visualizes, within a short time, pump-proportioning the major salad dressing products (oil, starch paste, eggs and liquid sugar) into a continuous mixer, where the product's immediately blended and homogenized for packaging (see diagram above). Ultimate in-stream blending of pump-metered prepared ingredients would provide, at low cost, an automated salad dressing system for operators of small dressing plants.



THIS UNIQUE double-headed, positive-displacement pump, with by-pass arrangement, simultaneously transfers and measures 600 gal. of starch paste/hr. in the manufacture of salad dressing.

OPERATIONS RESEARCH aims to provide objective standards by which managers may profitably evaluate various courses of action. It often serves as a means of showing new ways to achieve a desired goal—at considerably less total expense than the standard trial and error procedure.

Operations Research is *not* a substitute for management decision. Instead, it's an application of science, mathematics, and industrial experience to management problems. It provides management with a range of alternative courses of action as an aid to decision-making.

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HOW DO YOU IMPROVE METHODS? Chances are you use traditional approaches. Here's an ultra modern industrial tool, Operations Research, that seeks out methods improvements and solves many complex plant problems. It has recently been adopted by Armour and Company, consistent with the company's continuing program of streamlined, progressive management (FE, Jan. '59, p. 80).

What Is OR?

It's a philosophy and collection of techniques. It's the application to corporate problems of such scientific techniques as mathematics (including statistics), logic methods and procedures, as well as other special scientific disciplines.

RICHARD D. KORNBLUM
Operations Research Div., Armour and Company, Chicago

Many such problems as tackled by Armour's OR group, are handled by management groups in smaller companies. Their techniques are not called operations research. However, where variables and facts become more numerous than those in a simple situation, OR methods may be the *only* means for obtaining an accurate meaningful answer.

The Model

OR can be broken down into major classes of problems. All of these have a common characteristic—a *mathematical model* employed in the problem's solution by OR techniques. A model is a mathematically expressed statement of the system under study. You can determine how a change in one or several factors of the system being modeled will act on the system, or on other factors.

Utility of the model: You can manipulate the system symbolically (and economically) to see how changes in one factor affect other factors as well as the system (a plant, warehouse, processing department or a truck dock).

Assume you're studying a plant with various processing routes. Then manipulation of the mathematical model of the plant could show how much raw material and labor would be needed at different processing points in the plant under different plans of operation. Also, it will reveal the necessary cost to produce the desired end-product tonnage under each plan. If model is carefully constructed and "refined" by the OR group as a result of data "feedback," it will represent the s y s t e m closely enough to produce practical, enforceable results.

In some instances, model's manipulation must be handled by a computer. In any case, it is usually much cheaper to manipulate the model instead of the system and, most important, it allows the system to be studied without production delays and costly "fooling around" with the actual system.

Formulation of the problem and "construction" of the problem's mathematical model are 90% of the job. Solution of the model is

OPERATIONS RESEARCH ANALYSTS work out possible mathematical basis for typical allocation and distribution problem.

a small part of the overall project.

Classes of OR Problems

► **Inventory.** Important is the search for optimum inventory level for a product, or group of products, that will answer the restrictions of minimum risk of customer shortage, order time and quantity—and still give a minimum cost of maintaining the needed level.

Costs considered as input data for this type of problem include those relating to purchasing or to manufacturing product, and to holding product in inventory (storage, handling, damage, taxes, insurance).

Additional factors to be considered: Economic lot size and product price differentials that vary with lot size.

Possible savings by using OR to attack inventory-level problems are great. Such activity is carried on by manufacturers with appreciable in-process inventories of raw or finished product.

► **Allocation models.** This involves linear programming, a mathematical technique.

Types of allocation problems:

. . . *Job scheduling* to available machines in a plant so as to produce required units in least total machine time.

. . . *Solving transportation problems,* such as the shipping pattern that offers minimum cost of delivering a system's product requirements to pre-assigned destinations — consistent with manufacturing capacities of producing plans.

. . . *Production scheduling* between plants to obtain minimum operating cost for a multi-plant system, allowing for total required production and individual plant capacities.

. . . *Handling optimum product mix problems* covering situations such as minimum cost mixture of available ingredients that will produce desired end-product within required quality specifications. Example is problem in a processed meat product formulation at Armour.

. . . *Routing company salesmen* to arrive at an optimum cost pattern of routes and average time to be spent per call. Taken into account, here, is the principle of diminishing returns—after a certain time with a customer, added profits returned in the form of orders do not rate further call time.

► **Waiting-time models** make up another broad division of OR work. Here, problems are often called "Queueing Models." Objective in this type OR problem is to arrive at a solution giving minimum cost to the system, consistent with desired degree of service time.

► **Replacement models** constitute a class of OR problems concerned with replacing or repairing equipment (along with cost), enlarging production facilities (when and extent), and deciding whether to replace, as a group, parts that are constantly wearing (light bulbs, drive belts, etc.) or whether to replace only when failure occurs.

► **Competitive models** form a division of OR work often tackled by applying the "Theory of Games" technique. Industrial uses for competitive model applications include work in determining optimum strategy of bidding for construction contracts and optimum campaign for advertising (taking into account competition's most likely strategy).

OR Problem Approach

Regardless of problem type being attacked by the OR group, methods will often follow a sequence that breaks down into: Problem formulation, construction of the mathematical model, problem solution, and implementing solution.

1. **Problem formulation** is often the greater part of the entire job in an OR project. The OR group usually meets first with personnel of department presenting the problem in an attempt to define the question under consideration. It may happen that the problem, as first stated by the department concerned, will turn out to be merely a symptom of another larger problem. It is vital that the basic problem definition expresses the *real* problem to be tackled—not merely an off-shoot of some other question.

For example, Armour's OR group was asked for a solution to a minimum-cost, freight-distribution pattern for a multi-plant, multi-destination system. After several discussions between OR and the departmental personnel, it was agreed that shipping costs were but part of a larger picture which covered not only freight costs but also other cost factors native to production and procurement.

2. **The model** comes after problem formulation when OR generally proceeds to construct the system's mathematical model. Again, the OR team works closely with the department presenting the problem to make certain that the mathematical model being constructed will represent accurately the system being studied—both as to input and output factors.

3. **Problem solution** is next stage, i.e., actual solution and evaluation of the model. Methods of solution vary with the size and complexity of the model. Regardless of the model's nature, the basic method of solution is to fit (or "plug in") input data that varies with different alternatives possible for the system, and then evaluate the various solutions that result.

For example, in a production scheduling problem, an OR group may put into the model input data representing production capacities and their costs, as well as equipment needed for many different production requirement levels.

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Computer Aids in Solution of Model

If the model representing a system is fairly simple, solution with a desk calculator can be done by the OR department. With a more complex system model, it may be necessary to use an electronic computer to digest the mass of input data (representing different operating levels of system) and to produce the model solution.

If a company does not have its own electronic computer, such data-processing services can be rented by the hour. Armour has its own IBM 650 electronic computer. The Armour OR team's use of the 650 ranges from a processing problem which requires 15 minutes of computer time (12 hours if solved by desk calculator) to a large production allocation problem that uses 30 computer hours (600 man-hours on a desk calculator).

In these cases, the computer takes no part in formulating the model. Instead, it acts as a high-speed clerk (merely processing the data in and out of the model previously set up by the OR group) to produce the solution in a time that allows useful application of results.

Production level at which costs are at a unit minimum is then determined.

Another example of model solution could involve a loading dock-waiting time problem. The mathematical model is evaluated here by inserting data representing various expected truck arrival rates, trailer rental fees, loading costs, etc., for each arrival rate. The dock arrangement is then determined which will minimize truck-waiting lines and yet be consistent with lowest total costs.

In many instances, much input data must be collected by various company departments in order to provide realistic data for "plugging in" to the system's mathematical model.

4. **Implementing solution** is the last stage to the OR approach. This process "sees" that the OR solution is smoothly and realistically worked into the company's operations in order to realize practically a maximum of the potential profits indicated by solution.

Department Tie-In

In all above-mentioned steps, the OR group works as part of a unified, cooperative effort. OR doesn't charge into a problem area and grind out a solution alone and apart from the personnel of the concerned department. On the contrary, it vitally needs the participation of the concerned personnel —from early planning stages through solution implementation. Departmental personnel must be in constant contact with the OR group so as to insure the model's reality. OR may obtain the problem model's solution but, again, the concerned personnel know more about the solution's consequences and the means for successfully implementing the solution.

OR Group's Make-up

A typical industrial operations research team is made up of personnel having a common base of scientific and mathematical training as well as wide professional and industrial experience.

At Armour this group comprises: The OR department manager, a bacteriologist with process engineering and statistical quality control experience; a mathematician, trained in chemical engineering and statistics, with plant quality control experience; an economics graduate, coming from Armour's economics research department; a chemist with industrial management training and statistical quality control experience; and, an assistant statistician with a background in economics.

For training, Armour sent its group to Case Institute of Technology for an intensified short course. Several other qualified schools offer comprehensive short and long courses in OR subjects.

Some industrial concerns train their OR groups in another way. They engage university or private consulting firms to solve an initial company OR problem. During this initial OR problem structuring, the outside group trains the company's fledgling OR team.

Combining its skills and training with on-the-job experience, the OR group provides management with formidable means of solving many complex problems. (End)

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EASY-OPEN aluminum lid has built-in tab which is pulled to remove the lower lid. Top, which has smooth edges to minimize cutting, can be clamped back on the can with a tight fit.

THREE BASIC SIZES of new-type drawn aluminum cans are: 2½ in. wide x 1½ in. tall, 2½ x 2½, and 3 7/16 x 1 13/16. Modified forming equipment is also able to make containers up to 3 7/16 x 3 3/8 size. Note the recessed lid, designed for better shelf stacking.

Double-Bonus Can Lowers Costs, Ups Sales Appeal

Automatic technique for forming drawn aluminum cans from coated stock thins price spread between rival containers, gives fresh twist to in-plant can-making . . . Built-in zip-opener promotes consumer use-convenience

GREATER VERSATILITY for aluminum cans is promised by a new fabricating technique (unveiled last month) that handles pre-coated stock. At the same time, the new process allows use of a built-in zip-opener that gives lightweight containers added consumer convenience.

The result of joint research by Central States Corp., E. W. Bliss Co., and Kaiser Aluminum & Chemical, the can-forming method involves four new machines that eliminate most of the roadblocks that, up to now, barred wider use of drawn cans.

Significant fact is the use of enameled aluminum coil or sheet stock and specialized can-making equipment, which make these containers competitive with tinplate versions. Economical advantage of drawing lies in use of pre-coated stock. Other aluminum can-making techniques (impact extrusion and drawing-ironing) require costly subsequent enameling and baking techniques.

Also making the light cans more competitive are higher line outputs, greater labor-savings, and more economical scrap recovery.

New line operates at speeds up to 200-240 cpm., depending upon can size, and needs only one operator and one packer. Compared to that, an impact extrusion method used by a couple of brewers knocks out only 120 7-oz. cans per min., and requires several operators. Furthermore, recovery price of scrap amounts to 58-60% of original cost.

New can-making development also benefits from specially formulated coatings that don't fracture during the drawing process. That's because they have increased flexibility and use better bonding additives.

Developed were two-component coatings — a pigmented particle suspended in a solvent base—of the catalyst-organosol types. For the most part, resins are modified vinyls or epons rather than phenolics (that have less fracture resistance). Heat given off by the drawing process melts the pigmented particles into a free-flowing plastic state for subsequent hardening or setting upon cooling.

The easy-opening lid features an aluminum tab, which the housewife pulls, breaking lower seam to remove container top. Alcoa recently came out with a pull-tab, but lid can't be replaced. Central State's version embodies a lid with a deep, counter-sunk shape, so it can be replaced on can as a snug-fitting plug.

New opening principle is adaptable to round aluminum or com-

(continued p 49)

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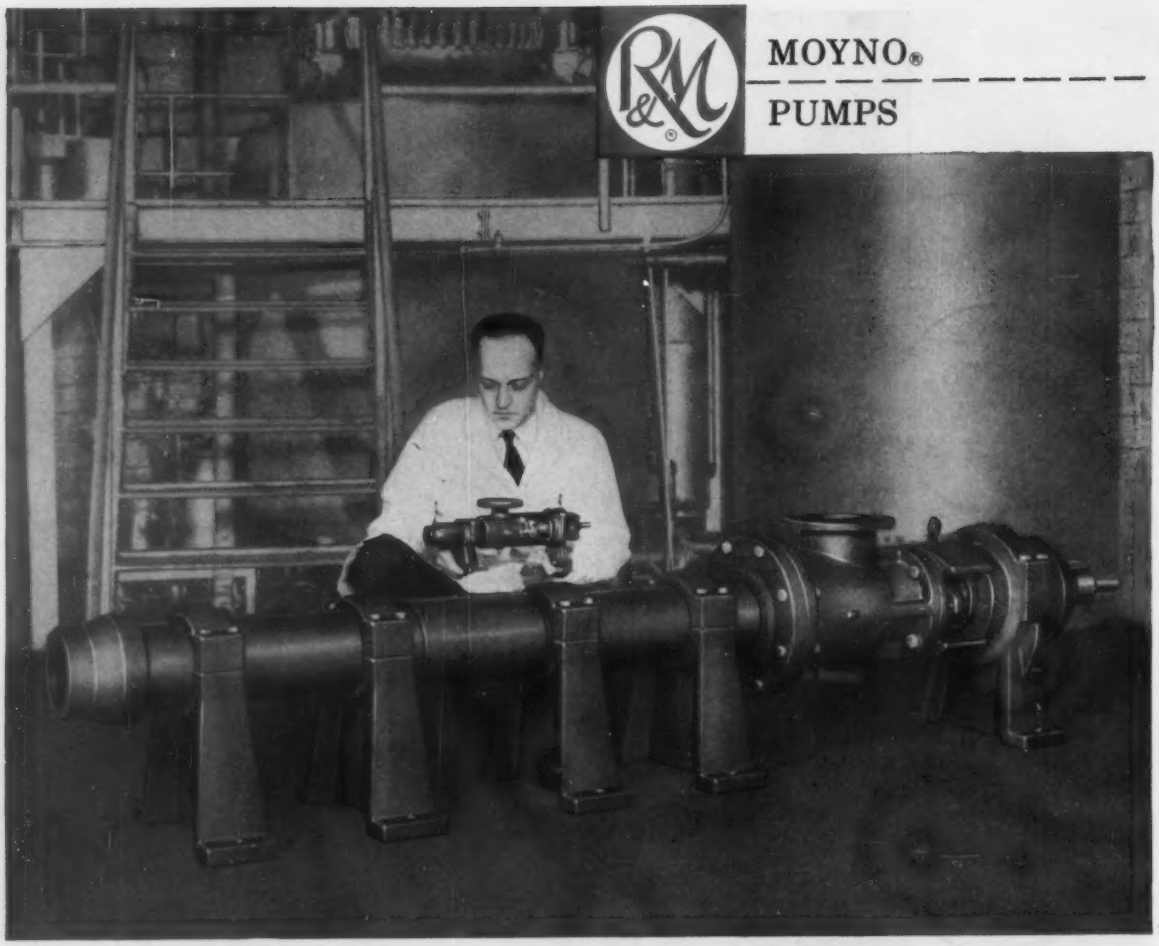

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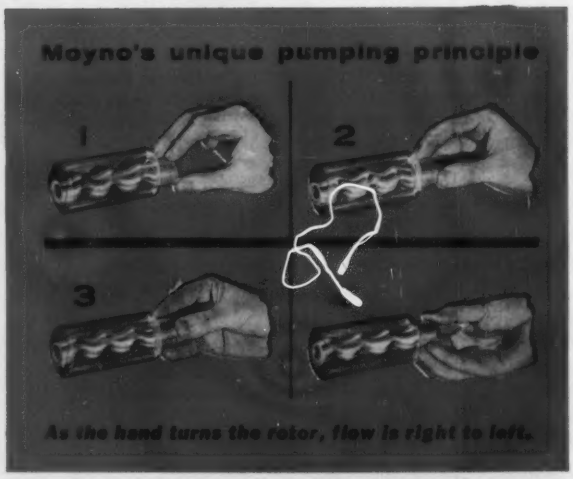

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posite containers (i.e., aluminum tops with bodies of other materials).

How New Line Operates

Fabricating technique is built around two to four machines, depending upon can style preferred. Required are two machines (combination blanker-drawer and trimmer-flanger) for smaller height cans. Taller cans call for an additional redraw unit placed just ahead of trimmer-flanger. And tear-strip cans need still another unit—a Central States' developed flange curler.

Line producing aluminum cans (without tear-tab) comprises two or three machines. First machine, a Bliss 60-ton single-crank press, employs a nested, triple-cavity die to blank and draw a cup from sheet- or coil-fed stock (gage: from 0.006 to 0.016 in.).

Operating at speeds between 65-70 strokes/min., it random-discharges cups (height one-half container's diameter) to the unscrambler. Then, cans are aligned in an open-end-up position onto conveyor system that feeds either the redraw press or trimmer-flanger (for smaller height cans).

Rotary redraw press is a 4-station, cam-operated machine operating at 50 (or more) rpm. Here, die draws cups to final depth and diameter (height equal to width). Then cans are transferred to the trimmer-flanger. Incidentally, four additional heads could be installed on redraw machine to increase output to 400 cpm.

Combination trimmer-flanger, a six-spindle unit, operates at 33⅓ (or higher) rpm. Can bodies are starwheel-fed to spindle head, where they're vacuum-held into position. Operation starts as two knives cut body almost to trim line.

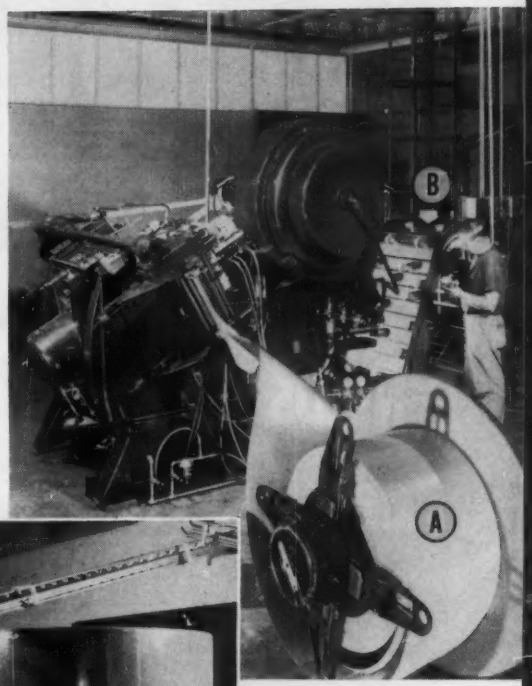
As turret rotates, knives recede, and trimming cutters travel from below to slit off excess stock. Then, as turret continues to rotate, body moves forward into flanging tool. Flanged body is finally pushed onto discharge chute.

Cans with tear-strip top require an additional step—the curling of can flanges in preparation for crimping of top to body.

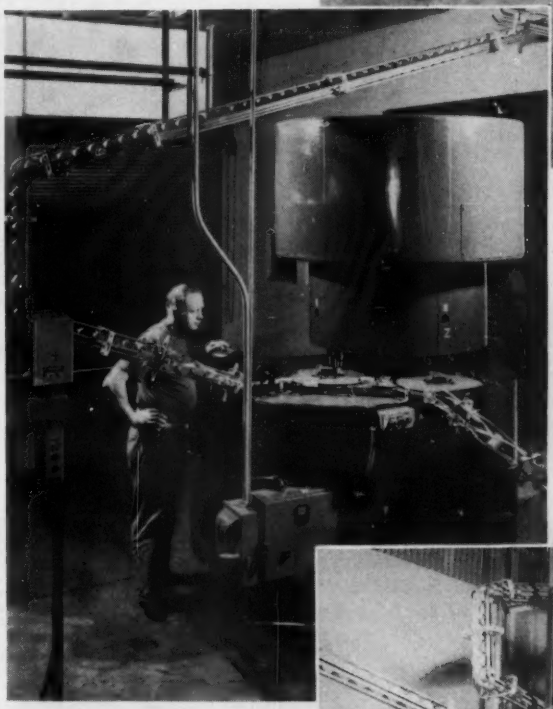
From the food manufacturer's standpoint, the new can-making methods are significant these three ways:

1) Captive can making. Where volume use of aluminum justifies it, the new fabricating line can be

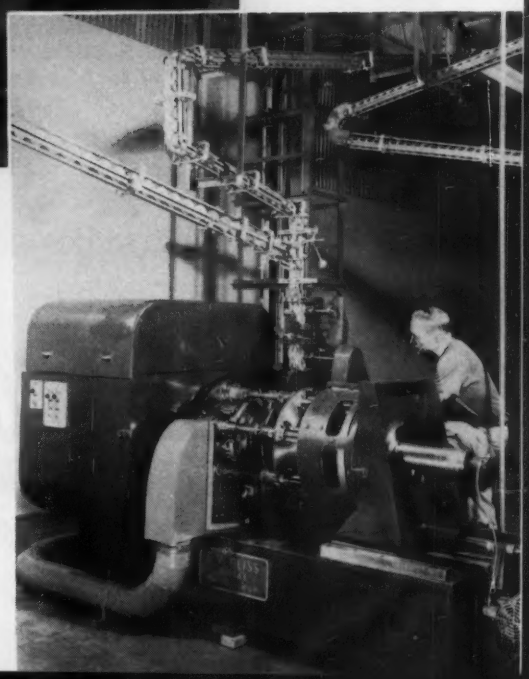
How New-Type Drawn Cans Are Made



PRESS blanks and draws sheet- or coil-fed coated aluminum stock (A) at rate of 65-70 strokes/min., discharges cups onto conveyor (B) that carries them to . . .



. . . **REDRAW MACHINE.** Here, cups are drawn to final diameter and height at speeds up to 400 cpm when 4 additional heads are used. Cans are then transferred to . . .



. . . **TRIMMER-FLANGER,** a 6-spindle unit operating at 33 or more rpm. If tear-strip opener is designed, cans would then move to another rotary machine where flanges would be curled for crimping top to body. Complete assembly can turn out 200-240 cans/min., requires only one operator and one packer.

Take the cost-saving, space-saving advantages of instantaneous shell-and-tube heaters . . . add *positive control* of heated liquids regardless of peak loads or long stand-by periods . . . and this Instantrol Heater Package is *it!*

The heat-anticipating Instantrol bulb provides instant hot water under perfect control, *regardless of widely fluctuating load changes.* Adjustable within 90°-200° F. limits, the Instantrol® Regulator Assembly includes patented anticipating bulb, "dead end" valve, necessary tubing, etc. It is also available as a complete Heater Package, ready for installation.

In typical applications, the Instantrol Assembly supplies constant hot water for dishwashers, sterilizers and high-temperature processes—and the Hot/Cold Water Mixer tempers this same supply to the lower temperature requirements of shower rooms, wash basins, etc.

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installed at about half the capital investment required for a tinplate body-making assembly (that requires slitter, body-maker, flanger, seamer, and tester).

Cost runs to about $70,000 for a new two-machine (blanker-drawer and trimmer-flanger) line, $85,000 for a three-machine line with additional redraw unit for taller cans. A tinplate body-making line, on the other hand, figures out to around $180,000.

2) Portability. With only two or three machines required, they can be moved from one location to another.

3) Flexibility. Installing the additional redraw machine means a greater variety of can sizes.

What's to Be Packed

Food processors are already testing these new shallow drawn cans with regular end and conventional seal for heat-processing a variety of products.

First break-through appears most likely in the meat field, where several outfits are experimenting with potted meats, devilled ham, vienna sausage, etc., in 2½ x 2½ and 2½ x 1½ in. cans. Other areas where R&D is being pushed: tuna and shrimp (peeled and deveined) in 3 7/16 x 13/16-in. cans; baby foods in 2½ x 2½-in. cans; and frozen fruit juice concentrates in 2½ x 2½-in. cans.

Orange juice freezers, however, face a potential barrier because shallow drawn cans can't be handled on present equipment. They would have to start out with different blast-freeze beds (lower), fillers, and can-seamers. Too, there's the question of whether the housewife will accept the new lower height can.

Others who have shown interest in these shallow drawn cans are those packing vegetables, mushrooms, and boned chicked in small-size tinplate cans.

Central States doesn't foresee breweries or soft drink bottlers adopting the cans. For one, they hold about 5½ oz., whereas beer, ale, and soft drinks are now packed in 12-oz. cans or bottles. Also, capacity of aluminum can-making lines comes nowhere near the 1,000/cpm. output of conventional tinplate lines.

But Central States Pres. J. R. McCuskey is optimistic about the tear-strip can. He sees it being widely adapted for such items as candies, jams and jellies, cheese spreads, dressings, shortening, peanut butter, etc. (End)

Now—one high-purity salt is ideal for virtually all foods made today. The salt is Sterling Purified Salt, always more than 99.9% pure sodium chloride (less than 30 ppm calcium and magnesium, less than 0.2 ppm trace metals). Meat packers prefer it for a wide variety of operations, including curing, pickling, flavoring—and find it compatible with all phosphates. Canners like the way Sterling Purified Salt always protects food flavor, color and texture. Bakers use it in preparing the sponge. Food processors find it eliminates any problem of oxidative rancidity in vegetable fats and oils caused by ordinary salts. The list could go on indefinitely—for Sterling Purified Salt is today's superior salt, the salt that consistently upgrades fine products. Try it on your lines. To order, contact International's local representative or the nearest district office: **Boston, Buffalo, Charlotte, Chicago, Cincinnati, Detroit, Newark, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis.** Or write direct to International Salt Company, Clarks Summit, Pa.

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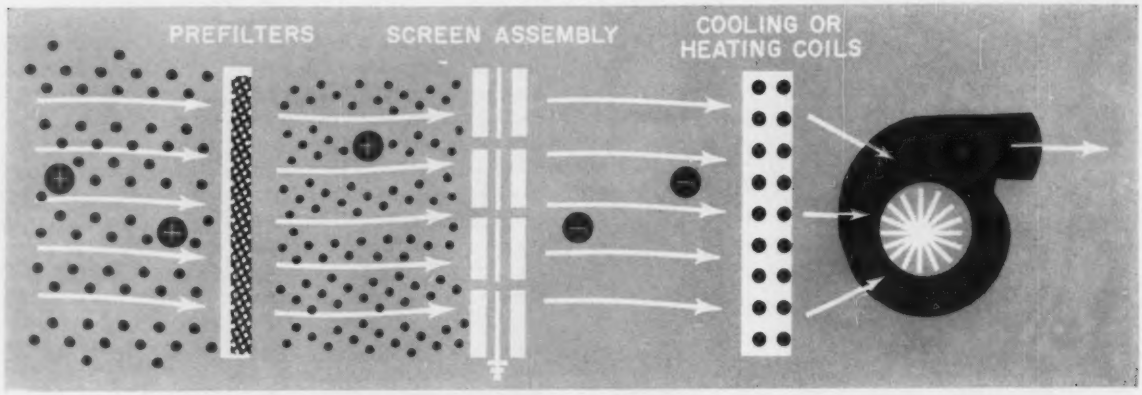


AIR FLOW through control system starts at pre-filter (left), which receives outside air laden with positively charged dust particles. Latter are rendered non-settling and pick up negative charge as they are shattered in passing through the high-voltage screen assembly. Treated air goes to conditioning units that feed the duct system.

Electronic Dust Control

Dust particles are repelled from usual settling surfaces by high-voltage air treatment that shatters and ionizes them

ELECTRONIC CONTROL of airborne dust and dirt has greatly simplified maintaining top-level sanitation at the suburban executive offices of Stephen F. Whitman & Son, Philadelphia confectioner.

Moreover, the system has cut the use of cleaning supplies substantially and enabled reassignment of maintenance personnel. As a result, the company plans to install similar control at its ultra-modern North Philadelphia plant now under construction.

The electronic technique subjects pre-filtered air to a high-voltage static field just before it enters the conditioning system. This action shatters the dust particles to a size below 0.1 micron and negatively ionizes the particles as well as surrounding air molecules. Both mechanisms are vital to efficient control.

First, particles of size below 0.1 micron are permanently suspended by air currents and Brownian motion, thus cannot settle out as dust accumulations. Secondly, the negative charge is subsequently picked up by untreated dust particles in a conditioned space, which causes them to be repelled from walls and ceilings.

Known as Statronic, the system was developed by CRS Industries, 1405 Locust St., Philadelphia, and unit is available by sale or rental.

LEONARD TRAUBERMAN
Associate Editor, "Food Engineering"

Solves Tough Problem

Whitman's interest in the system was sparked by a sanitation problem that started almost as soon as its new office building was occupied some three years ago. According to D. McGovern, company systems analyst, he was confronted with an unusually persistent, greasy dust that coated everything — walls, floors, ceilings, and desks. Although offices were thoroughly cleaned by the night crew, the dust was back to greet him the next morning. Cleaning of leather upholstered furniture was a particular problem because of dust penetration.

And, of course, the general inconvenience to office personnel was demoralizing.

The condition was baffling in view of the building's desirable location on high ground overlooking the Schuylkill River. Furthermore, the problem had never existed at the company's plant in the industrial section of Philadelphia.

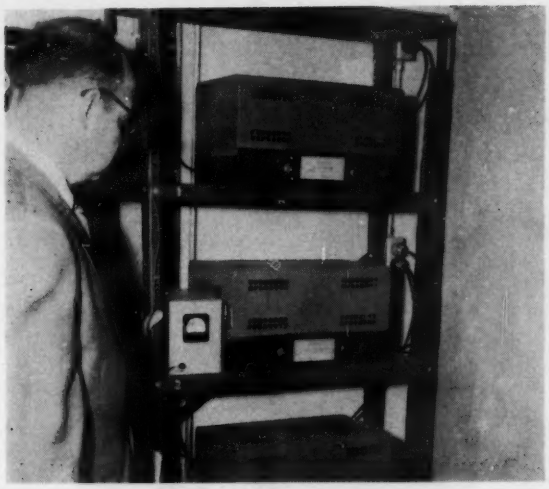
Extensive investigation disclosed that, although the building was on high ground, convection currents were carrying dust from the heavily traveled Schuylkill Expressway below. To complicate matters, this air was also found to be contaminated with furnace exhausts from industries as far as ten miles away.

Unsuccessful attempts at correction included discontinuing the practice of oiling the pre-filters, and subsequently replacing them with higher-efficiency units. Other air-cleaning systems were also considered, but the electronic technique was chosen because of its efficiency, ease of maintenance, and relative low cost.

System In Action

Electronic dust control is based on the concept that there are two air streams in a conditioned space. The primary stream consists of air discharged into the room directly from conditioning units. A secondary air stream also exists within the space. It is induced by the low-pressure area surrounding the high-velocity primary air at the point of entry.

While high-efficiency filters may control the cleanliness of the primary air stream, dust picked up



COMPACT POWER PLANT Four static generators power Whitman's four banks of high-voltage air-treating screens (photo below). Each handles a maximum of 10,000 cfm. of pre-filtered air. System Analyst D. McGovern checks generators for proper operating voltage.

Cuts Sanitation Costs

and circulated by the secondary stream is beyond control. It eventually settles out on room surfaces.

Therefore, the electronic approach aims at control of both primary and secondary air-dirt effects. This is accomplished by the system's dual action.

Particle-size reduction keeps the dust permanently suspended in the primary air stream. Since most ventilation systems are not 100% recirculating, fine particles eventually pass out of the building as fresh air is introduced. Negative ionization prevents fine particles from adhering to room surfaces, and eliminates dirt impingement from the secondary air stream.

Physically, Whitman's system consists of four banks of a three-screen assembly parallel to and directly ahead of the pre-filters. In operation, dust-laden air first passes through the filters. Then it traverses the screens where particle-size reduction and negative ionization occur.

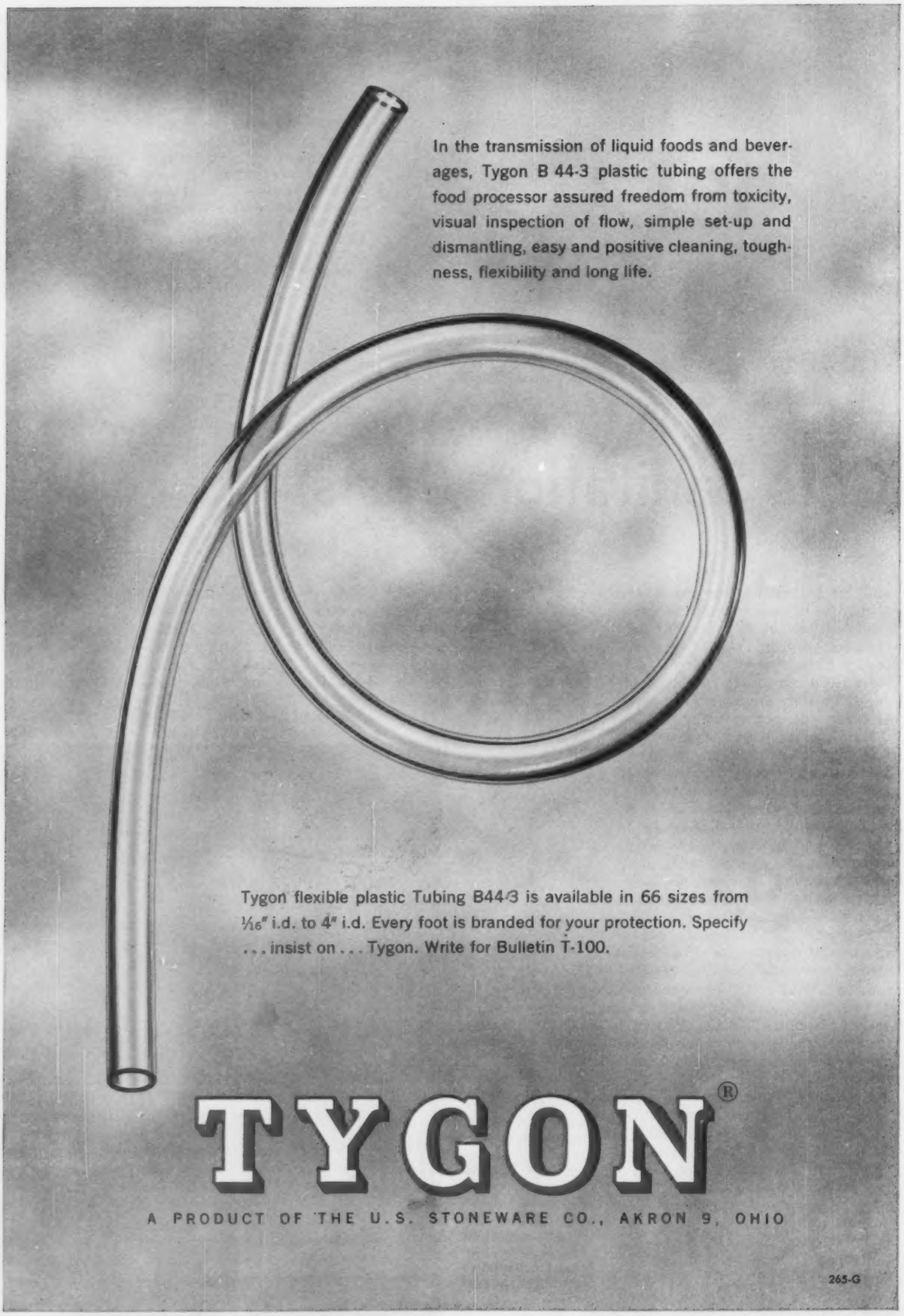
Each screen assembly is powered by a static generator conveniently located outside of the air-treating zone. A pilot light indicates whether or not screens are receiving proper operating voltage. Latest generator design includes an output voltmeter.

Air velocity across the screens is controlled at between 300 and 500 fpm., and maximum flow per generator-screen assembly is 10,000 cfm. Power requirement is 75w., 115v., single phase. Pressure drop through the screens is negligible.

Whitman checks the system once a week. Periodically, screen and insulator surface are cleaned to remove a small dust accumulation which, otherwise, would reduce operating efficiency.

Servicing the generator, which has no moving parts, consists merely of replacing standard vacuum tubes, fuses, and pilot-light bulbs. (End)

SCREEN BANK consists of three separated screens installed perpendicular to air flow. They are of ¼-in. mesh, 17-gage galvanized wire cloth. Center or ground screen is installed in an angle or channel sliding track, and two static screens that carry the high - voltage charge are carried by insulators on the ground screen.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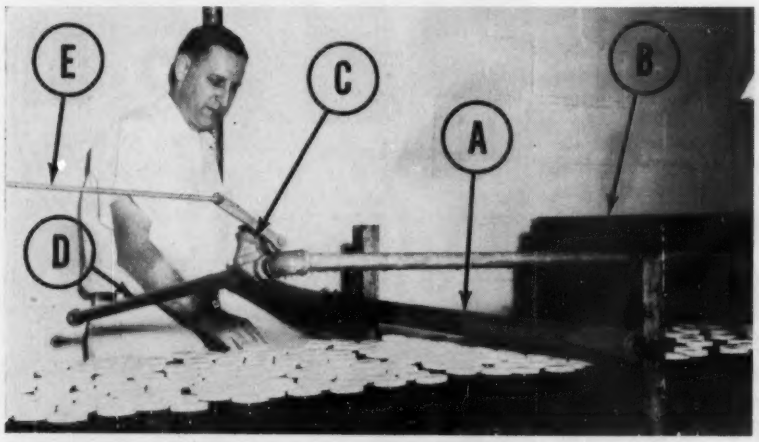
practical ideas

Ups jar-labeling efficiency . . . Curbs steam trap freeze up . . . Eases poultry processing

INGENIOUS AIR-JET DRYING SYSTEM SOLVES KNOTTY PRESERVE-JAR LABELING PROBLEMS

Jars of jams, jellies and preserves coming out of our home-made continuous spray-type cooler were often too wet to label. The labels didn't stick, so jars had to be hand-wiped and then re-labeled. What's more, water from the jars diluted the glue and when it got too thin it had to be discarded. Naturally something had to be done to overcome this condition, because it made the job of labeling even more difficult and resulted in loss of glue.

So we rigged up an on-the-line jar-drying system. We tapped a 2½-in. pipe (A in photo), with ⅛-in. holes spaced 1 in. apart and connected it to our air (40-50 psi)



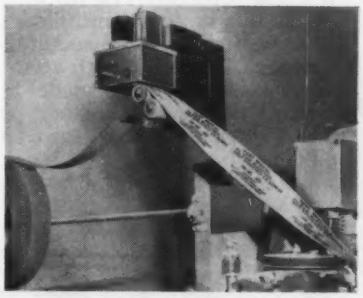
line. Horizontal pipe's mounted on vertical angle irons attached to frame work of wire-mesh conveyor carrying jars from cooling tunnel (B).

Pipe can be readily adjusted to accommodate jars from 8 to 14 in. high by slipping its ends into either of two pairs of eye hooks that were permanently mounted to the angle irons. To do this, we welded ½-in. dia. rods (2½ in. long) to both ends of the pipe, and attached 1½-in.-dia. circular rings at rods' free ends.

But when the jar-system was installed, we ran into still another problem: How to clean jars contaminated with products spilled from uncapped containers? Girls had to remove these jars from the line, and wipe them clean before feeding them onto conveyor traveling to labeler.

Naturally, these added operations entailed unnecessary labor costs and delayed our production considerably.

The solution was simple, once we learned that the girls could detect uncapped jars by differences in sound of air impinging upon the moving jars. It involves a method of remote opening of valve (C) on water-spray pipe (D) by means of rod (E). Then, at end of the conveyor line, we installed another perforated pipe (not shown) to direct air onto wet jars and thus dry them before they proceed to the labeler.—*Jerry Schultz, Production Manager, Wm. Barnes, Inc., Minneapolis.*



Prints Header Tapes As Bags Are Sewn

International Milling Co., Minneapolis, has come up with an efficient, economical way to identify contents of its plain flour bags for special customers or particular brands.

Instead of using conventional bag header tape already preprinted with special brand or customer names, it prints identification on plain tape as part of the bag-sewing operation. A small automatic printing unit ("Rolaprinter," Adolph Gottscho, Inc., Hillside, N. J.) is attached to the sewing machine. Copy is set up in advance on sleeves which can be quickly slipped onto printing unit.

Header tape is fed through printer as it proceeds to waxer and sewing head. When product change takes place, operator quickly slips off one printing sleeve and replaces it with another. This arrangement eliminates stocking a wide variety of preprinted tapes, with attendant inventory and record-keeping problems. Furthermore, unprinted tape is cheaper than the printed variety.

This is a Knife

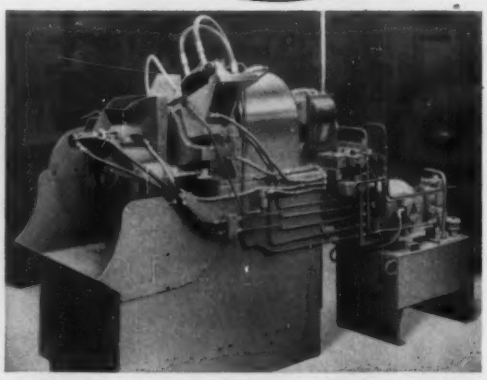
. . . it was *designed* by Urschel
. . . it was *engineered* by Urschel
. . . it was *manufactured* by Urschel
for an *Urschel machine*

Closeup of specially treated Urschel knife edge

It is the most important part of the machine because it cuts the product. The thickness of this knife is controlled to less than one ten-thousandth of an inch. Knives of such accuracy have *never* been made by others. This accuracy makes it possible to stack many knives on a knife spindle with such precision that knives can be replaced without adjustment and without having the knife rub against mating parts. This accuracy helps to reduce maintenance to a minimum.
Induction heating is used to harden only the edge of the knife to a greater hardness than would be practical to harden the entire knife. The hard edge causes the knife to stay sharp for an extended period. Soft material backs up the hard edge so that the knife will bend rather than break into fragments if the knife strikes a foreign object.
The selection of stainless steel in this knife and its treatment is based upon many years of metallurgical experience in the testing of stainless steels for the cutting of food products.

This is a Machine

. . . it was *designed* by Urschel
. . . it was *engineered* by Urschel
. . . it was *manufactured* by Urschel
for the *making of Urschel knives*



This is only one of many machines made in the Urschel shops for the manufacturing of knives. Standard machine tools cannot be purchased for the economical making of Urschel knives for the required rigid specifications. Research is continuously carried on at Urschel Laboratories in search of better methods and better materials for the manufacture of knives.

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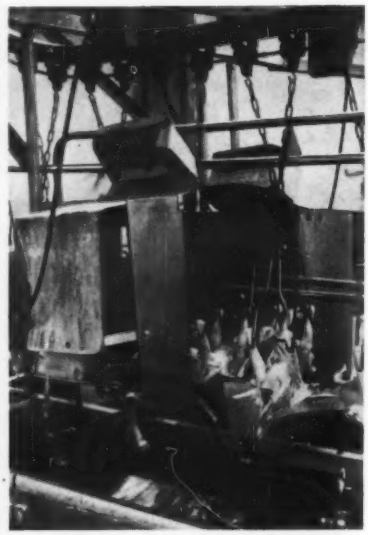
practical ideas

Automatic Head Release

The three-point shackle suspension (head and two hocks) is accepted as the best position for eviscerating poultry. At the end of this line birds' heads must be released from the shackle to be automatically decapitated. The "head-knocker" does this automatically.

At Armour's Turlock, Calif. poultry plant, the head-knocker comprises two identical units, one on each side of the line. (Photo.)



Powered by a gear-head motor, three rubber paddles fixed to a cylinder, revolve counter-clockwise. As poultry pass within its arc, paddles flip the birds' heads from shackles.—(FE Staff.)

Tips on Controlling Roof Rats With Traps

Control of the roof rat is simplified where the specific site of infestation or feeding permits use of "1080." However, food plants have areas where it can't be used, and in such cases best control is with traps.

For small grain mill, we use at least a gross of traps for one setting. These are carded and positioned so they interrupt rats as they go to feeding areas. Only occasionally do we bait traps. Then we use wieners, peanut butter, or candy.

Traps should be fixed or tied to prevent them from falling when sprung. We nail some to joists or sills at "swingunder" points.

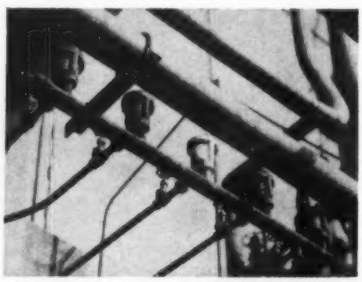
To intercept rats in their climb from one floor to another, we hang traps to pipes with rubber bands. The band is fixed to two nails driven into each side of a trap.

By placing a trap in every run, most of the colony can be eliminated. Total eradication is sped by gassing every possible nesting area (A Dust for high places; G-Fumigant for inside wall areas).—*David E. Anderson, Evans Laboratories, Inc., Little Rock, Ark., in report to National Pest Control Assn.*

"Anti-Freeze" Trap Hookup

Most products processed from fats (esters, rust inhibitors, oleic and steric acids, glycerine, etc.) solidify at normal temperatures, so the lines through which they are pumped are heated by steam tracers. Since these processes are continuous, one solidified line can shut down the entire plant. And, it would take only one steam trap failure to do this.

At Technical Products Plant of Swift & Co., Hammond, Ind., thermostatic traps tended to freeze and fail during cold weather. Maintenance costs were high, too. After replacing them with Armstrong No. 801 traps no failure occurred, even during eight straight days of below-zero weather. The maintenance problem, also has been eliminated.



Secret is in placing traps in groups of 6-18 (photo) next to a common discharge condensate manifold. Radiant heat from this manifold and, also, adjacent traps that are operating, keep traps that are not operating from freezing.

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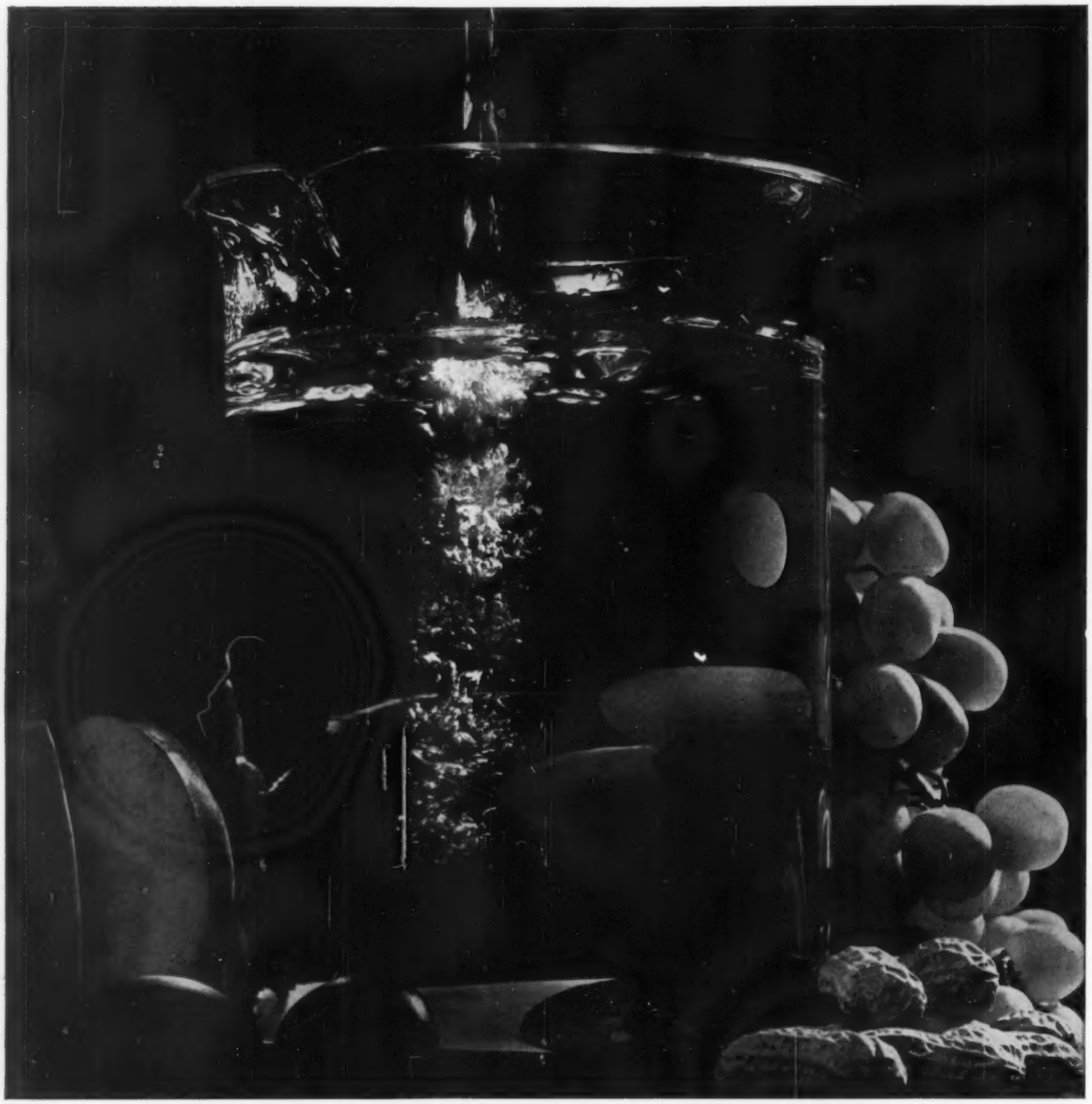

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JOHNS-MANVILLE

Special 8-Page Report

Better Container Inspection

. . . is possible with a variety of advanced systems. They'll automatically "eagle-eye" your container for defects and your products for contamination. Here's a wide range of cost-cutters that may hold the answers to your inspection problems

FOR YEARS, cost reduction—geared to remove the "faults" from packaging-line operations — has been the least talked about and one of the most frustrating problems faced by plant operators.

Many managers still believe that simple quality-control of raw materials, packages, and products in process is enough. But in practice, it hasn't worked.

Urgently needed is an integrated quality control system to achieve integrated cost reduction. This means increased quality-control through advanced package inspection systems.

Sure, you can run into fewer package rejects and simplify package inspections if you:

► Check incoming package supplies to see that they come up to "specs."

► Control product quality so that it doesn't adversely influence packaging operations or the quality of your final package product.

► Maintain your filling, closing, labeling, and other packaging machines in ship-shape order.

In checking packaging supplies, be sure that guarantees covering performance, fabrication, and protective properties are written into the orders. These guarantees, along with a close check on material quality and use, will assure excellent results in performance and minimize package objects.

If you haven't adopted a good material-inspection system, it's possible that: (1) container won't hold the desired product weight or fill; (2) caps won't provide an airtight

JOHN V. ZIEMBA
Senior Associate Editor, "Food Engineering"

seal; (3) labels won't be properly applied; and (4) shipping cases won't meet size and weight specifications.

Result? You've multipled the need for on-the-line inspecting. Too, production-line performance will be adversely affected. Not only will faulty containers create production-line jams, they will also damage packaging machines. Machines will in turn produce even more faulty package products that call for even greater emphasis on inspections.

Product quality, too, bears watching. If a beverage contains traces of foreign matter, it will certainly be spotted by the customer. Trace contaminants can cause "gushing" that will complicate filling operations — even result in slack fills. And variations in product density will produce different package weights at your volumetric filler.

Packaging machines must be kept operating efficiently. All the effort in controlling product and package supplies will go down the drain if your filling, closing, and labeling machines aren't functioning. Fills or weights will be off target. Containers won't be properly sealed, and some glass containers may pass through uncapped. Broken chucks on can-closing machines will rim-damage cans. Labels won't be applied and, if they are, they'll be off position. Code markings might even be missing.

Packaging Line Economics

Perhaps the biggest lesson which exponents of good management have tried to teach us over the years is that control of costs on packaging lines is not something you can turn on or off. Securing information as to what your packaging line costs actually are, and taking action to see that costs are kept in line on the basis of reasonable standards, are jobs that need to be done *all the time,* not just once in a while.

Just being cost-conscious isn't enough in the economic and industrial atmosphere of these days. You have to be working away at your packaging line costs regularly and systematically. You may even have to *increase* some packaging costs to get others down.

Most important is the need for correct filling free from foreign matter. If fills aren't accurate, cost reductions can't be achieved through product savings. Process efficiency suffers, since proper fill may be essential to adequate sterilization and proper cook of many processed foods. And, in some cases, better or more uniform quality products can't be produced.

Foreign matter can include almost everything from pieces of metal and broken glass to mold buttons in returnable beer or soft drink bottles. In some cases, molds stick to the bottom of bottles and float to the surface during processing.

Here are some other defects packers or bottlers must look for:

In glass containers—checks and scuff marks, cracked or badly chipped bottoms, chipped crown areas, loose or missing crowns or labels, improperly positioned labels, and scuffed or damaged caps.

In cans—dents or damaged cans, low vacuum, poor closures (top or bottom seams), inadequate processing (likely to result in product spoilage), missing code marks and labels that are missing or not properly positioned.

In bags or pouches — leakers, code marks, sealing, etc.

In cartons—codes and flap seals.

In labels—codes, scuff marks.

Most food plants utilize human inspectors to cope with packaging defects. While he is versatile in many respects and, under certain conditions, can accomplish an excellent inspection job, he doesn't fit into increasingly higher speed bottling and canning lines. Visual inspection devices (on bottling lines) have aided human inspection efficiency, but they're still indequate for certain foreign materials.

Preventive Measures

A broadside attack on container-handling methods can save you money, and safeguard you from complaints.

Perhaps no branch in the food industry leans as far backward to check containers as does the manufacturers of baby foods. A prime objective is to reduce breakage of glass jars on lines and to insure that no glass particles get into products.

For instance, one packer of baby foods controls glass breakage by tempering cold jars before going to washer. Tempering permits warming of jars before cold-weather use. To further curtail breakage, packer employs spring-loaded dump boards when removing empties from cases. Others temper cold glass containers as they are conveyed past a battery of infra red lamps.

As a further precaution, production-line equipment automatically stops whenever a jar breaks. Then, 25-30 jars on each side of the "break" are removed—just in case flying glass particles may get into them—and the line is washed down. Packer even X-rays the next three retort crates to make certain no jar goes out of the plant with broken glass in it.

To prevent bottle damage, such containers can be strengthened by spray-coating with modified silicone. Bottles are coated from shoulder down, with the silicone absorbed by the wet glass and without need of heat treatment (421).

Brewers are reducing filler bottle breakage about 80% by replacing conventional high-breakage "knocking" with speedily automatically controlled ultrasonic agitation at rates of 600 bpm. Here, ultrasonic agitation degasses beers, reduces foaming to assure more accurate fills.

Something difficult to check on-the-line is "gushing" that shows up when a customer opens a beverage bottle. Trouble stems from dirty

Inspection Equipment 'Musts'

Here's what a manufacturer must take into account when designing inspection systems for today's highspeed bottling lines:

1. Smooth, high-speed handling of bottles to insure efficient operation and prolonged mechanical life of the machine.
2. Simple operation and maintenance of unit, since electronic engineers aren't available to operate it.
3. Ability of unit to compensate for labels as well as size, thickness, and color of bottles.
4. Versatility in handling different sizes, shapes, and designs.
5. Need for building into the machine highly reliable inspection and rejection systems.
6. Good detection capability in face of bottle scuffs, lettering, and mold marks.
7. Reduced contrast resulting from colored bottles and liquids.

For more information, circle key numbers on Reader Service Card, back of book

crowns, oil (carried over with CO_2 from dry ice converters), excess air (in beverage), too much agitation, protein particles, brush bristles (from soaker-washers), microorganisms, scratches inside bottles, etc.

Prevention is possible through good housekeeping practices, deaeration, and control in operation of soaker-washers. Washer must be checked to make certain it's doing efficient cleaning and rinsing job. Soakers shouldn't carry over metallic ions from soaking-cleaning solutions. Soaker brushes should be adjusted to prevent bottle scratching, and worn brushes must be avoided to eliminate scoring of bottle necks. Water and syrups must be deaerated to remove excess air.

Installation of can dryers is one way of not only eliminating can corrosion but also adhesion of labels. One such unit (300-cpm.) consists of a 4x5-ft. cellulose drying belt. Turning in opposite direction to can movement, belt absorbs surface moisture from cans as they roll over belt. Then, when belt passes over terminal pulley, an idler presses water from it (422).

Smoother synchronization of bottling (or canning) lines will eliminate breakage and product spillage. On bottling lines, for example, hydraulic motors can be located at uncaser, filler, and capper, and be remotely operated through electrically driven variable displacement pumps. Hydraulic drive accurately controls acceleration rates, cushions strain on machine parts and eases breaking when decelerating. With power spread from motors to several drive shafts located at various machines, all components run at proper speed-time relationship. This way, individual units are timed to one another without affecting other timing points. (423).

Built into some high-speed canning lines are such container-safeguarding systems as:

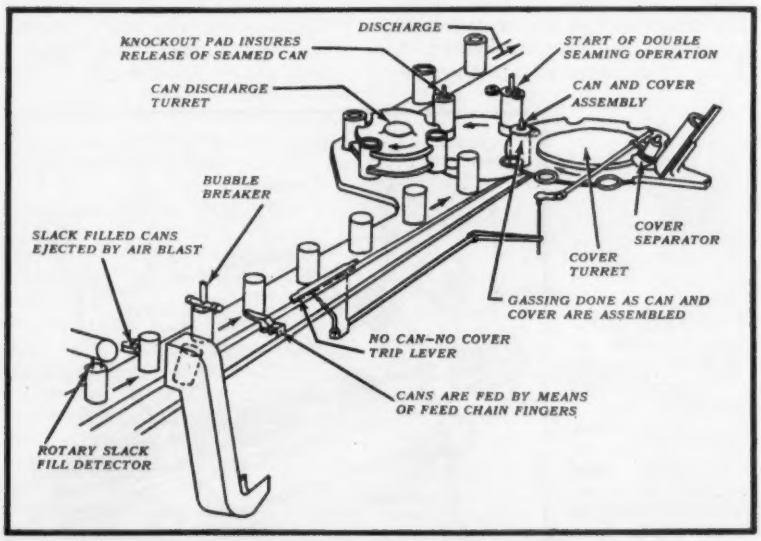
1. No-can-no-cover detectors that prevent cover from being separated from cover stack when no can is being fed to seaming unit. (Similar detectors are employed on glass, carton and over-wrapping lines.)

2. Slack-fill detector and ejector to prevent underfills from entering closing machines. Rotary liquid-level detector mounted over can-feed chain consists of two electrodes that enter can and detect liquid level. Ejection of slack fills is accomplished by an air blast.

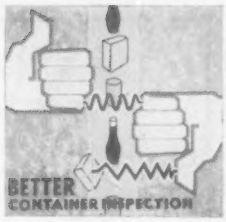
3. Positive spin-type knockout pads that eliminate possibility of scoring covers, and assures proper assembly of can and covers.

4. Filler drive to provide synchronous operation of filling and closing machines, thereby preventing product spillage during transfer (424).

Advantages and disadvantages of empty or full bottle inspection systems are interchangeable in most respects. Main disadvantage of the empty system is its inability to detect foreign material introduced by filling machines. Main advantage of full-bottle inspection is its capability of exercising quality control on bottle and its contents.


DISCHARGE
KNOCKOUT PAD INSURES RELEASE OF SEAMED CAN
START OF DOUBLE SEAMING OPERATION
CAN DISCHARGE TURRET
CAN AND COVER ASSEMBLY
BUBBLE BREAKER
SLACK FILLED CANS EJECTED BY AIR BLAST
COVER SEPARATOR
COVER TURRET
GASSING DONE AS CAN AND COVER ARE ASSEMBLED
NO CAN-NO COVER TRIP LEVER
CANS ARE FED BY MEANS OF FEED CHAIN FINGERS
ROTARY SLACK FILL DETECTOR

INSPECTION-ORIENTED canning line features such safeguards as no can-no cover trip lever, slack-fill detector-rejector, knockout pad, etc.



Here are some of the many automatic inspection (and even rejection) devices and set ups now available. They cover a wide variety of photoelectric, electromagnetic, electro-mechanical and purely mechanical or electrical systems. Let's focus in on some of these and see if you can't adopt a new cost-saver to your package-inspection operation.

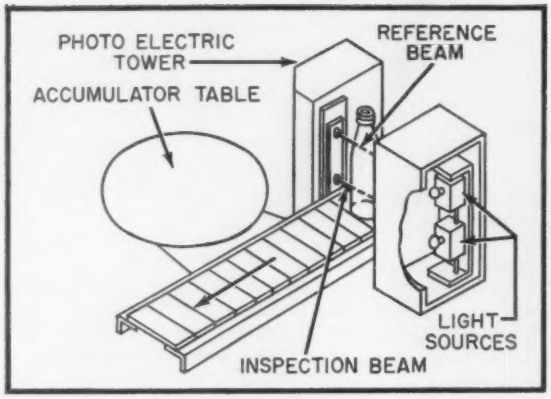
Putting Photo "Eyes" to Work

► **Twin-beam empty bottle inspector** consists of two focused light beams reacting on a pair of balanced photo-cell tubes in an electronic receiver. Both beams are vertically set in line with each other at a 90-degree angle from bottles' conveyor chain. Bottom beam is positioned so it just clears inside bottom of bottle. Top beam is mounted so it cuts leading edge of bottle at the same time as bottom one.

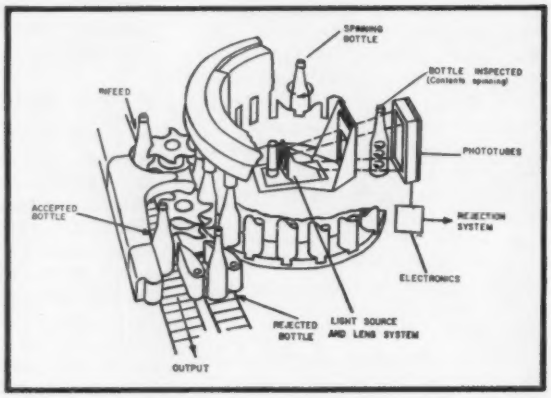
When a clean bottle (any color or shape) passes through beams, light on photo cells remains in balance and container continues uninterrupted along conveyor. However, a foreign object in bottom of container interrupts transmission of bottom beam's light and throws bottom photo cell out of balance with unaffected top cell to activate detection circuit. A red light signal goes on, conveyor gate is opened, and ejection system is energized. As the bottle neck passes through a third overhead beam, ejection arm removes bottle from line without interfering with others. Rejected bottles (touching or spread) are then automatically conveyed to an accumulating table.

Unit is quickly adjustable for all sizes and shapes of beverage bottles (from 6 oz. to quarts). Speed is 300 bpm. or 90-ft. min. chain speed (425).

► **Empty bottle inspector** (350 bpm.) consists of light source and electronic detection heads between which empties are conveyed. System inspects bottom portion of empty bottles by directing two narrow beams (inspection and reference) of light through



EMPTY BOTTLE INSPECTOR operates on principle of unbalanced circuitry. Contaminated bottles passing between inspection and reference beams disrupt circuit and activate bottle ejector.



FULL BOTTLE INSPECTOR takes revolving turret-fed bottles past multi-phototube inspection stations at speeds to 300 bpm. Amplified signal created by contaminant-containing bottle actuates rejection device.

bottle side. Inspection beam is focused ⅛ to ⅜-in. above bottom of bottle and reference beam directly above (to reduce timing and color transmission difficulties).

As a bottle passes through system, two photo cells in detection head "see" exactly the same thing, since both beams are symmetrically located on bottle. Should foreign matter on bottom of bottle block lower (detection) beam, a solenoid-operated plunger kicks bottle out of line and onto a rotary accumulating table (426).

► **Another empty bottle checker** (500 bpm.) accepts starwheel-transferred empties from a conveyor. Here, bottles are vertically inspected by a scanning system (photo cell) mounted above and a diffused light source below. System has a sensitive detection zone that's described by a conical volume emanating from the neck and covering full area of bottom for detecting foreign matter — even cracked or badly chipped bottoms. If a contaminated bottle is detected, a compressed air cylinder is actuated to reject the bottle (427).

► **Photoelectric control system** inspects jar or bottle closures for presence of protective-treated inner liners. Closures without liner present bright metal reflecting surface in beam of light source. Increase in reflected light raises photo tube output so that amplifier-driven relays applies power to solenoid-operated air valve. A blast of compressed air then removes rejected closure from belt or chute (428).

► **Automatic bottled beverage** inspector's multiple electronic "eyes" check filled containers for hard-to-see particles, rejects those contaminated at 150 bpm. speeds (429).

Lamp-lens system projects a strong, narrow light beam through filled bottles and onto a bank of phototubes. Tubes and associated electronic amplifier are designed so that small light changes are amplified into strong currents actuating a selector mechanism. Selector then automatically rejects particle-containing bottles.

Particle is detected by its movement within liquid that's swirled by high-speed spinning of bottles securely clamped to turret. As bottles are moved forward, spinning's suddenly stopped during turret's mid-cycle, and photo-electric cells scan swirling contents.

Fluctuation in light beam's intensity (created by particles) is detected. A "memory" device retains contaminated bottle's identification until it arrives for automatic rejection at discharge gate.

► **"Memory" unit** automatically prevents filler and capper from operating when a bottle is missing. Capping of partially-filled bottles is also controlled.

Unit's memory element is a magnetic steel disk coupled to bottling line. Coupling relates angular rotation of magnetically stored signals (from two photoelectric eye inspection stations) on disk to inspected bottle's changing location along bottling line. Magnetic storage and sensing in memory unit is independent of disk speed. Thus, performance isn't affected when line starts, stops, joggles, speeds up, or slows down.

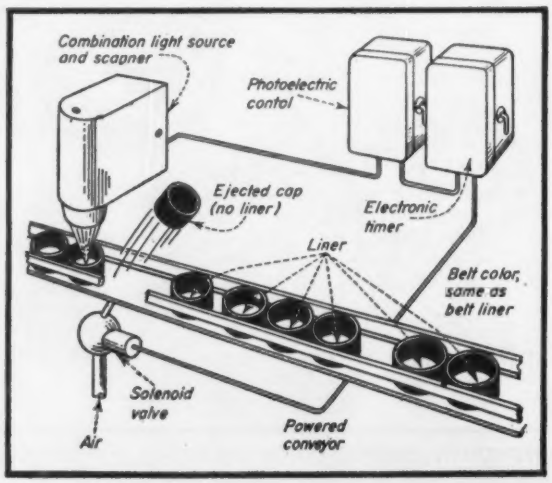
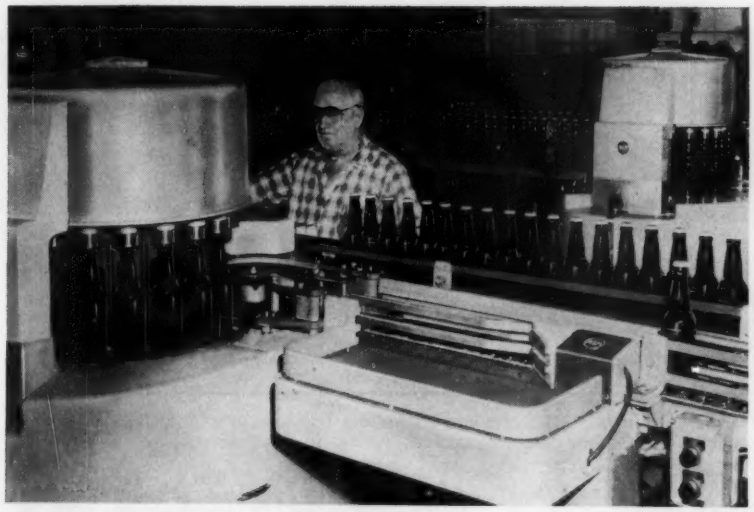
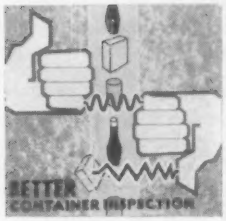


PHOTO-EYE SYSTEM inspects jar or bottle closures for presence of protective inner liners. Closures without liners present bright metal surfaces which reflect light beam to raise photo tube output and actuate reject device.



MULTIPLE PHOTOTUBE INSPECTOR automatically checks (150 bpm) foreign particles in filled bottled beverages and rejects those that are contaminated.



A missing bottle activates a signal relayed from first phototube inspection station to memory disk's outside track (for storing). When missing bottle section reaches filler, signal from outside track-read head prevents release of product from filling machine.

When a partially filled bottle is discharged from the filler, signal is transmitted from second phototube station to disk's inside track. And, when partially filled bottle reaches reject station, signal from inside track-read head actuates reject mechanism. Then, as missing bottle section arrives at capper, signal from third read head (sensitive to either disk track) stops capping machine from operating. Double-track erase head finally removes marks on memory disk after corrective actions have been made (430).

► **Advance warning system** for detecting missing crowns consists of a photoelectric eye detector and bell. Device detects missing or slow-moving crowns half way down feed chute to give advance warning of trouble. Result is fewer stops and the opportunity to eliminate uncrowned bottles (431).

► **Uncapped bottle detector** consists of proximity limit switch combined with photoelectric eye source and photo cell. Unit, when detecting an uncapped bottle, triggers a relay, then actuates a reject device to remove bottle from conveyor line.

Bottle reaching detection position is directly below switch's sensing head and between light source and photo cell. Comparison is then made of voltages to provide the relay-actuating difference voltage. With no bottle in detection position, proximity coil voltage is just enough to prevent triggering of relay. Capped bottle increases voltage to nullify the "difference" voltage and to prevent energizing of relay (432).

► **Automatic unit's photelectric eye** scans (for ejecting) cans for shiners, torn labels, twisted or uneven labels, dog ears, double or flagging labels at speeds up to 1,000 cpm. Feeler-finger system contacts each label to "feel" that it's in proper position. Improperly labeled cans drop through a track, with a specially shaped gate then closing against falling can to prevent properly labeled cans from following reject even though containers travel bead-to-bead (433).

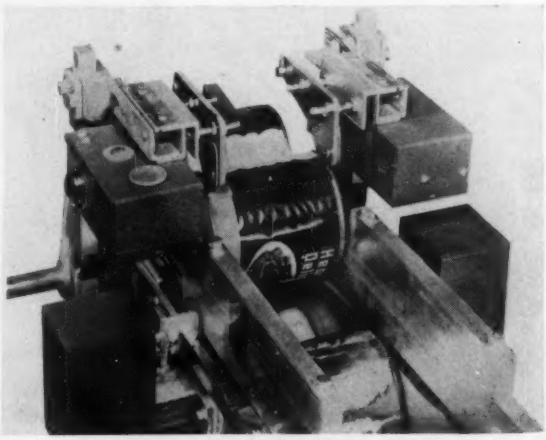
► **Photoelectric system** detects and controls labels (with reflecting surface beneath them) missing from cans or glass containers. System employs two light sources and electronic time-delay relay. One light beam is directed onto photoelectric control across conveyor line. Other light source is located on same side as photoelectric control so that its beam is reflected to phototube from a passing unlabeled container.

Photoelectric control recycles time-delay relay every time it "sees" a label. Should an unlabeled can go by, photo control continuously receives light. Result is that control isn't pulsed. And no pulse is relayed to timer so that its load circuit opens and then shuts down conveyor (434).

X-Rays Useful, Too

► **X-ray** beams monitor can-fill levels, abolish variations and weighing jam-ups on 900 cpm. lines. Precise X-ray gauges detect level variations of 1/29 oz. or less.

System works on principle of detecting over- or under-filled containers in accordance with absorption or passage of X-rays. Rays are absorbed to greater degree by over-fills to signal over-



LABEL INSPECTOR employs photo electric eye to scan passing cans for torn, twisted, and flagging labels at speeds to 1,000 cpm, then rejects improperly labeled cans.

For more information, circle key number on Reader Service Card, back of book

fill circuit for counting and/or rejecting containers. Empty head space in under-fills pass more rays to activate under-fill circuit.

Monitor consists of :(1) X-ray tube encased with transformers in grounded steel tank mounted on one side of conveyor line; (2) tiny cadmium sulfide crystal detector providing a sensitive, high-gain pick-up; (3) two-component beam-aligner, and (4) control unit (amplifier, control knobs and relays) for regulating sensitivity.

When over- or under-fills are detected, a pair of 51-amp. relay contacts are energized at control panel. Electric signal then operates a solenoid pilot valve supplying air pressure (100 psi.) to an air-ejector nozzle that blasts rejects from line and into a bin (435).

► **Fluoroscopic X-ray unit** employs operator to inspect carton-packed packaged products, such as wrapped candy bars, for foreign matter and broken, missing or mis-shapened bars.

In operation, X-rays passing through packaged product produce light as they strike a fluorescent. Intensity of light depends upon thickness and density of packaged item, thus making visual inspection possible. When operator spots a defective package, he presses a lever that actuates a motor-driven reject mechanism (436).

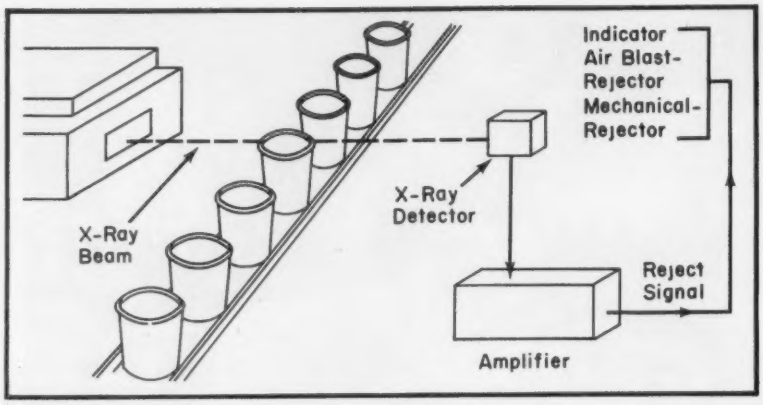
► **Mobile X-ray inspection** for checking foods is being used by Army Quartermaster Corps. for routine checks of stock-piled canned rations. X-ray trailer's mobile mounting permits transfer from warehouse to warehouse in order to inspect slow-moving stock.

Unit consists of X-ray and operator's compartments, both enclosed within a lead-lined trailer. X-ray compartment comprises ray-generating unit, movable 18x24-in. fluoroscopic screen, powered section of roller conveyor, and remotely controlled handling "fork."

When operating, cartons are fed onto cleated steel-belt conveyor feeding into trailer. If fluroscopic examination doesn't reveal swelled or indented cans, slack fills, etc., operator discharges carton from trailer via powered roller conveyor. Should inspection indicate some defect, operator remotely activates fork that permits inspection of contents at angles up to 90 deg. from horizontal. Unit checks a carton per min. (437).

► **Closed-circuit television X-ray system** permits continuous container inspection on a TV-like screen—with images 10,000 times brighter than those obtained by conventional fluoroscopy.

System comprises of X-ray sensitive camera, control unit, and viewing monitor. Latter may be up to 1,400 ft. away from camera, and easily viewed in normally lighted areas. Image size is electronically variable from ½ to 3 times that of original. And images may be tape-recorded (438).



HEIGHT-OF-FILL MONITOR employs X-rays to detect over or under-filled containers. Amplified signal from detector operates automatic rejection system.

New Isotope Methods

► **Nuclear-electronic height-of-fill scanner** feedback-controls operation of filling machine. Unit is designed for "on target" fill-inspection of liquids and drys in cans or packages of various sizes and shapes at speeds of 1,000/min. In operation, containers are conveyed between a "long-lived" gamma source and ray detector. Since amount of "gammas" reaching detector is proportional to fill height of containers, detector's signals are related to average height of fill.

Amplified signal is indicated on meter in fill-control instrument. Integral with the meter are "high" and "low" contacts, from which feedback control of filler is actuated. Simple adjustment of measuring head accommodates wide range of container sizes or fill levels—including low-fill measurement and control in phase or

CONTAINER FILL is "ray-checked" here at 1,000 cpm and improperly filled cans are ejected from conveyor line. Adjustable head accommodates wide range of sizes.

sequence filling when target level is low (439).

►**"Ray" unit** checks container fill at 1,000/min., then automatically rejects those with varying fill heights. It handles containers of many different sizes and shapes, and can be installed before or after sealing or closing machine. Accuracy is to 1/84 in. with liquid-filled products. With drys, accuracy is dependent on uniformity of product composition and horizontal surface maintained after filling. Inspection-rejection system comprises measuring head (isotope source and detector) and control unit.

As container passes under measuring head, small changes in individual fill height vary the amount of isotope energy passing from source to detector that translates variations into corresponding voltages. A reject signal is generated whenever incoming voltage is outside of preset limits. Signal then energizes a mechanical or pheumatic device to remove improperly filled containers from conveyor (440).

Magnets Help, Too

► **Metal detectors reveal** tramp metal in non-metallic packaged products. (For canned products, such detectors must be installed ahead of filling machines to remove metallic particles from products).

Such electronic inspection tools consist of a pair of boxlike compartments separated by spacer blocks to form an inspection aperture. Packages passing through aperture are continuously screened by a high-frequency magnetic field. Presence of stray metal creates an electronic disturbance that triggers a device that may ring a bell, turn on a light, mark or reject (automatically or semi-automatically) package, and stop conveyor

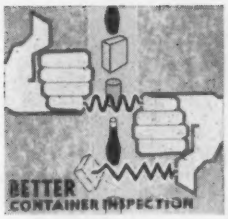
Unit's upper compartment (or detector) houses signal receiver and detector coil tuned to oscillator circuit. High frequency signals are generated by lower compartment (oscillator section) and field coil. Field balance is obtained with field coil positioning. Metal particles passing within inspection aperture unbalance field to induce signal in detector circuit, which energizes controls operating reject and conveyor systems (441).

► **Metal detection system** spots minute particles of magnetic and non-magnetic metals in packaged foods traveling on a 240-per-min. conveyor. Low-cost unit registers positive finds by sounding an alarm, stopping belt, or rejecting metal-containing packaged product. System comprises:

1. Metal detector — two metal box-enclosed magnetic-field inducing coils and electronic chassis mounted on top. Unit is set on rubber shock mounts (to absorb vibrations), and connected to electronic supply and control circuit.
2. Power supply unit—voltage regulator and oscillator supplying high frequency 105 and 260 V. dc. and 6.3 V. ac. heater power.
3. Test scope—cathode ray tube to sense and adjust detector's sensitivity.
4. Ejector — energized paddle which swings diagonally across conveyor to reject package.

Operation is based on principle of metal particle shifting magnetic field induced by top and bottom (in relation to conveyor) induction coils. Shift's detected by bottom coil, which produces a signal that actuates ejector (442).

► **Permanent, non-electric magnetic can separator** is mounted over elevator feeding continuous cooker or casing machine to remove empty cans and most of those partially filled (up to half full). Many canneries employ air or steam pressure to knock out only empty cans.



As empty or partially filled can passes under eliminator, it's attracted to a magnetic plate. It remains there until another empty comes along and pushes first can over edge of magnet to be rejected. Unit handles 450 cpm. (443).

► **High-speed unit detects uncapped bottles,** provides early warning of capping jam-ups, cuts down filler downtime, and eliminates manual inspection of crowning operation. Unit inspects 6, 10, and 12-oz. bottles up to 410/min., quarts up to 250/min. And it's adjustable for various types of caps.

Detection is performed magnetically by sensing device at crowner's outfeed. Unit can be set to sound an alarm, stop the line, or both.

Upon spotting uncrowned bottles, unit's built-in "memory" differentiates between and responds to major or minor capping troubles on the line. When uncapped bottle passes through sensing device,

MAGNETIC METAL DETECTOR employs high-frequency electromagnetic field to check packaged foods for foreign metallic particles. Particles react with field to actuate signal operating automatic package-rejection system.

For more information, circle key number on Reader Service Card, back of book

detector sounds an alarm and keeps line running as it "remembers" (for 4 sec.) sensed uncapped bottle. If another uncapped bottle is detected during this 4-sec. interval, unit automatically shuts down filler (444).

Checking missing cans in 6-pack carry-home cartons is a problem faced by many packers. A low-cost solution is to mount three permanent electromagnetic rollers at tail end of case sealer's compression belt. This way, as 6-packs leave carton packer, they pass under rollers that are hooked up to copper tube-housed limit switches. If carton is minus a can, then tube drops forward (from horizontal) and contacts limit switch that sounds an alarm or lights up a red warning light.

Other Container Aids

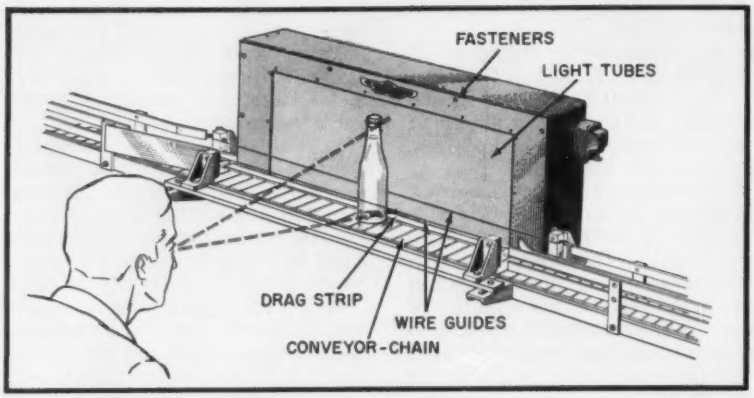
► **Two light-types of inspection** boxes are presently employed to eliminate eye strain. One, for empty or filled containers, operates on principle of oblique illumination, with an edge-lighting effect produced throughout bottle. No direct light is directed in inspector's eye.

Other type transmits soft pink light through bottle. Spectral curve assures excellent bottle illumination out of beer's sensitivity range. Emitted peak also affords good illumination for dark-colored soft drink beverages (445).

► **Filler-hopper level control** for accurate container fills consists of capacitive level-sensing probe and electronic control, suitable for operating pneumatic-diaphragm valves. Probe relays signal to electronic control circuit through coaxial cable. Responding to rising or falling product level around probe, electronic unit activates air-pilot valve that modulates 15-psi. air-pressure supply over 3 to 15-psi. range. Pneumatic signal actuates small control valves fed to auxiliary control unit (446).

► **Continuous fill controller** reduces product giveaways by automatically compensating for product-temperature changes during filling. Unit holds overfills to 0.1 oz. per quart container.

Net volume delivered to container is regulated by filler bowl's temperature-sensing bulb, with sensing signal activating motor drive connected to volume adjusted. This way, container fills are continuously corrected according to predetermined temperature-density relationship for liquid (447).



SOFT PINK LIGHT, "windowed" in inspection box, reduces operator eye-fatigue as he checks rotating bottles for contaminants.

► **Semi-automatic beverage inspection unit,** an electro-mechanical device, embodies three principles: (1) swirling liquid contents of bottle while under inspection to make moving particles more visible, (2) employing an optical arrangement to eliminate glare, and (3) reducing eye-strain to increase operator's efficiency by permitting him to view bottles at a 90-degree angle to light's path.

In operation, bottles are delivered to inspection device by star wheel or worm in-feed. As bottles enter unit, each one is positioned on one of twelve lowering cups evenly spaced around a revolving turret. In turret's forward movement, an upper cup assembly engages top of each successive bottle. At the same time, bottom cup's lift lowers to rest bottle upright in cup so it is securely clamped (top and bottom). A turret revolves and a high-speed belt engages a pulley attached to bottom of each lowering-cup shaft to spin bottle.

When bottle approaches discharge star wheel, bottle spinning is braked, and container proceeds onto conveyor. Spin-brake cycle is designed to allow liquid to continue swirling around in bottle until after inspection, or bottle containing foreign particle is removed from line. (448).

► **Versatile electronic inspector** checks packages for a variety of defects such as caps, weight, and product level. Operation depends upon high frequency current passing through package. All materials respond to current in proportion to their electrical properties and to volume of material present. Since some materials conduct more efficiently than others, it is sometimes possible to single out certain ones inside a package to determine if they're present in proper amount (while ignoring other components).

Applications include: (1) removing under-weight packages or those not filled to proper level; (2) sorting out and removing from conveyor belts cracker packages without proper number of wax paper-wrapped inserts; (3) eliminating packages not filled to proper level, and (4) rejecting cartons without correct number of bottles or bottles aren't filled (449).

Added Practical Ideas

If you run into trouble with "cocked" caps (cause of imperfectly sealed containers) when you switch from "press-on" to "screw-off" caps, an automatic alarm system will help.

First, install (at a capper discharge) a horn between two brass disks fixed to a bracket and suspended level with conveyor. By adjusting bracket, you can detect cocked caps on any size jar. Clearance between two disks, however, must be controlled, since clearance between cocked and uncocked caps is small. Transformer current supplied to horn can be calibrated to tolerance before installing it between disks.

When jar with cocked cap passes under disks, lower one makes contact—much like pressing a car horn. Operator hears horn, and removes improperly capped jar from line. (End)

ACKNOWLEDGEMENT: The author expresses appreciation to the following for their assistance in preparation of this Special Report: *Boris Miller*, Barry-Wehmiller Machinery Co., St. Louis; *Paul M. Werth*, Industrial Nucleonics Corp., Columbus, O.; *R. L. Underwood*, Pacific Packaging, Belmont, Calif.; and *F. C. Turner*, RCA, Camden, N. J.

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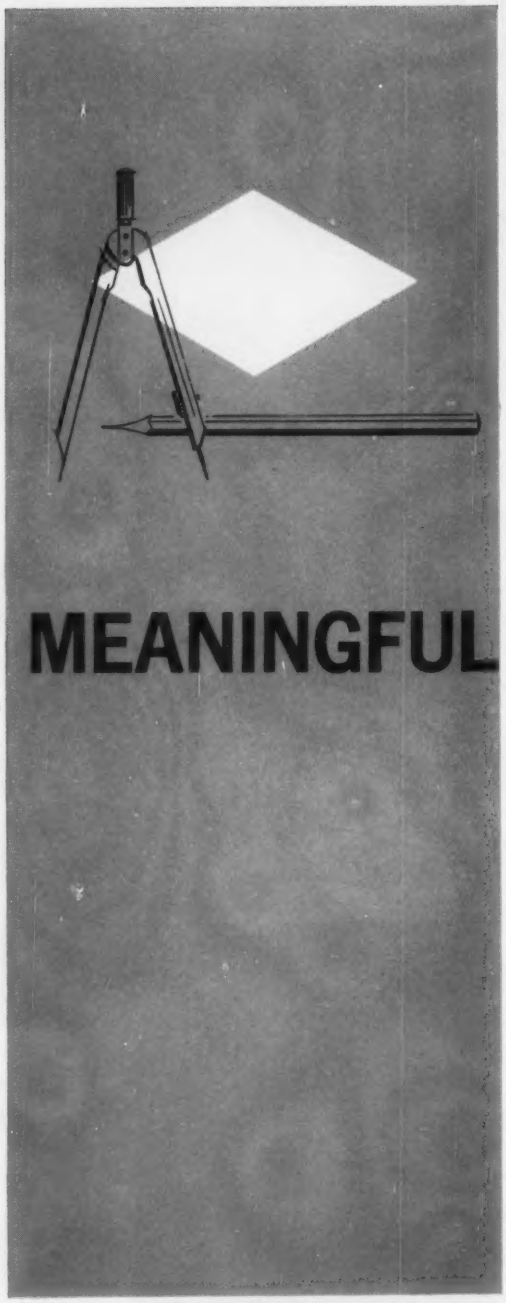

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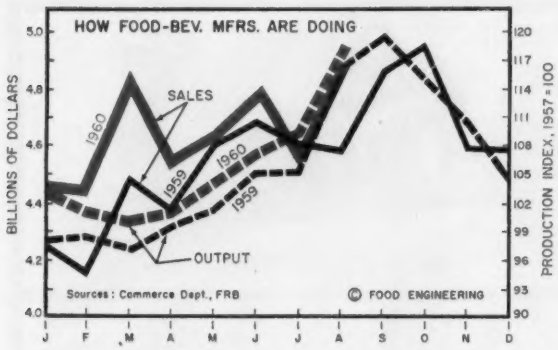


Industry Barometer: No Blues Here

While the over-all economy seems headed nowhere in particular, food-beverage sector maintained its perky pace. At the third-quarter mark, retail sales still slogged 2.5% ahead of the '59 rate—**but food store volume surged ahead 4.4% and eat-and-drink places maintained their 3.8% edge.**

This last figure, though, may be a smoke signal of future troubles. In recent months, eating-out has shown a smaller rate on increase over '59 levels. And dining-out activity is usually a good clue to consumer confidence.

As the chart indicates, sales and output of food-beverage manufacturers show continued improvement. Through August, this industry hefted dollar volume a striking 4%, while all-manufacturers barely kept even with '59 pace. And physical output for food-beverage firms is 2% up.

Food Outlet Decline Continues

Number of food stores declined 14% the past 6 yr., reports Audits & Surveys Co., N. Y. C., in its 7th National Sample Census of Retail Distribution. Despite this drop (from 384,616 outlets to 332,490), their sales volume climbed 24%.

Food Missing Overseas Bet?

Despite the spectacular performance by a few outfits, food industry lagged in building overseas plants during the Fifties. According to data gathered by Office and Business Economics, food industry's manufacturing investment abroad was 70% higher last year than in '50—vs. 153% gain for all manufacturing industries. And of the 9 industry groups listed, food was a poor tail-ender.

Europe, as expected, got the heftiest increase—food firms upped their investment there 207%. Elsewhere, gains were: Africa, 133%; Asia and Oceania (Australia, New Zealand, others), 122% each; Canada, 61%; and Latin America, 18%.

Swift's Road Show Scores

Best way to sell merchandise to retail buyers is with a sample offered in an attractive setting.

With that truism in mind, meat packer Swift restyled an old Greyhound bus with a refrigerated display case and comfortable accoutrements (wall-to-wall carpets, hi-fi). When the mobile showcase stops at a supermarket, store manager is invited to see company's complete meat line in a pleasant atmosphere.

After 208 appearances before dealer groups in 6 mos., showcase is called "a successful sales tool."

Bakers Exploit The Seasons

Is the retail baking trade leveling out its historic "peak and valley" selling cycle? Alex Weber, gen. mgr. of Caravan Products, thinks so.

Pointing out that his firm enjoyed strong sales gains during the traditionally slow June, July, and Aug. months, he said it was because bakers are becoming better merchandisers. For example, they're getting more mileage from each season by offering a wider variety of items. A case in point, he says, are picnic specialties which offset summer-time sales downturns.

A Sober Look At Europe

Rising personal incomes in Western Europe have led many to envision supermarkets sweeping across the face of that area. But expansion is bound to be slow, National Assn. of Retail Grocers warns. "There are more new ones under construction in some U. S. cities than in all of Europe," the trade group says.

Chief roadblocks, as Nargus sees them: High real estate costs, customs, legal restrictions, lack of home refrigerators, and small car-owning population.

BRIEFS

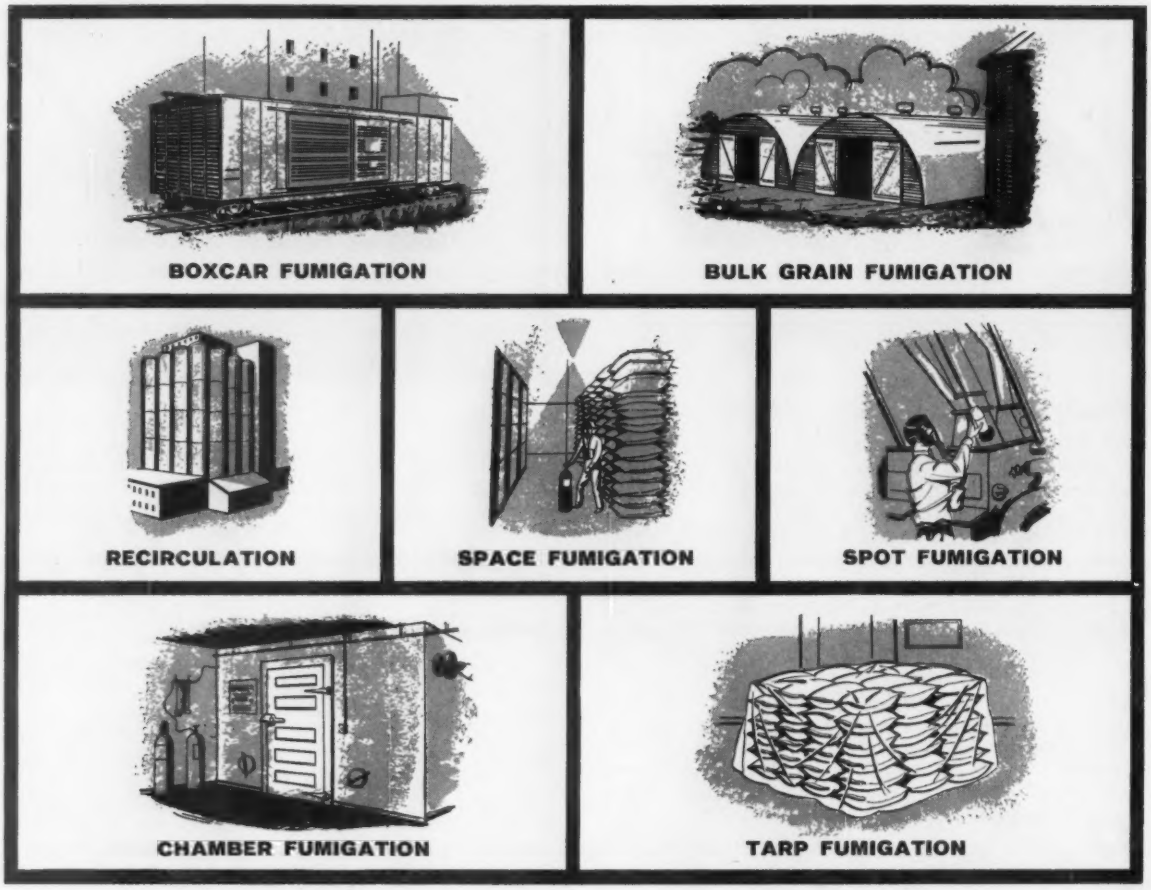
Regional inserts in national magazines may win back some of food money that's been poured into TV, as witness switch by Tea Council and C&H Sugar from video to print.

Bakers hope to slash distribution costs by having store personnel do shelf-stocking. Baby food firms follow this tack, but pay stores to do the job.

Average store does 35% of frozen food volume in prepared items, Campbell-Swanson's Frank McGuinness says.

Institutional soup market is now a $46-million a year business, USDA reports.

DOW | FUMIGANTS



PROTECT YOUR BULK OR PROCESSED FOODS WITH DOW FUMIGANTS

As the nation's food supply grows, the job of guarding your dollars-and-cents investment in stored food products against damaging attacks by insects and rodents becomes more important. Grain weight losses from devouring insects can amount to as much as 10% annually. Other insects and rodents feed on milled or processed food products, often reducing them to a total loss to the processor. The answer: check insect and rodent damage *before* it starts. Fumigate your stored grains and milling machinery with a Dow Fumigant.

Whatever your problem, there's a Dow Fumigant designed to help you. These quality products—Dow Methyl Bromide for space, chamber, tarpaulin, boxcar, or forced-air recirculation of bulk grains; Profume® for the same applications, but where a warning odor is desired; and Dowfume® EB-15 for spot fumigation around milling machinery—have been fully tested and proved effective by many years of use in all types of storage facilities.

Used according to directions, these Dow Fumigants will impart no residual odors or taste to grains or fully prepared food products and they will not affect milling qualities. Whatever your fumigation problems, call the nearest Dow sales office, or write for full information to: THE DOW CHEMICAL COMPANY, Agricultural Chemicals Sales Department **223KE11,** Midland, Michigan.

PRODUCTS ADVERTISED HEREIN COMPLY WITH U. S. LAW

When used as directed on label and in accordance with good practices, they comply with the Food and Drug Law and other Federal Laws.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

Words can't describe the flavor, so let us send you a sample

When you add Tora Food to a food product, something wonderful happens.

We can't really describe it, except to say that Tora Food intensifies and improves the original flavor.

That's why we want to send you a complimentary sample of Tora Food. Then you can try it in your own lab—see for yourself how this superb primary-grown food yeast adds sales appeal to many types of food products.

Incidentally, Tora Food is earning a reputation as a tremendous nutritional booster. Protein content is guaranteed to be better than 50%, and 6.7% of this is lysine. It's a rich source of vitamin B complex, too.

Why not mail the coupon today? Let us send you a complimentary sample of Tora Food. There's absolutely no obligation . . . and you can't lose.

TORA FOOD® by Red Star

Yeast & Products Co.

MILWAUKEE 1, WISCONSIN

RED STAR YEAST & PRODUCTS CO.
DEPT. FE1, MILWAUKEE 1, WISCONSIN

I'd like to find out how Tora Food will improve our products.

☐ Please arrange a session with your technical men.
☐ Please send me a complimentary sample of Tora Food.

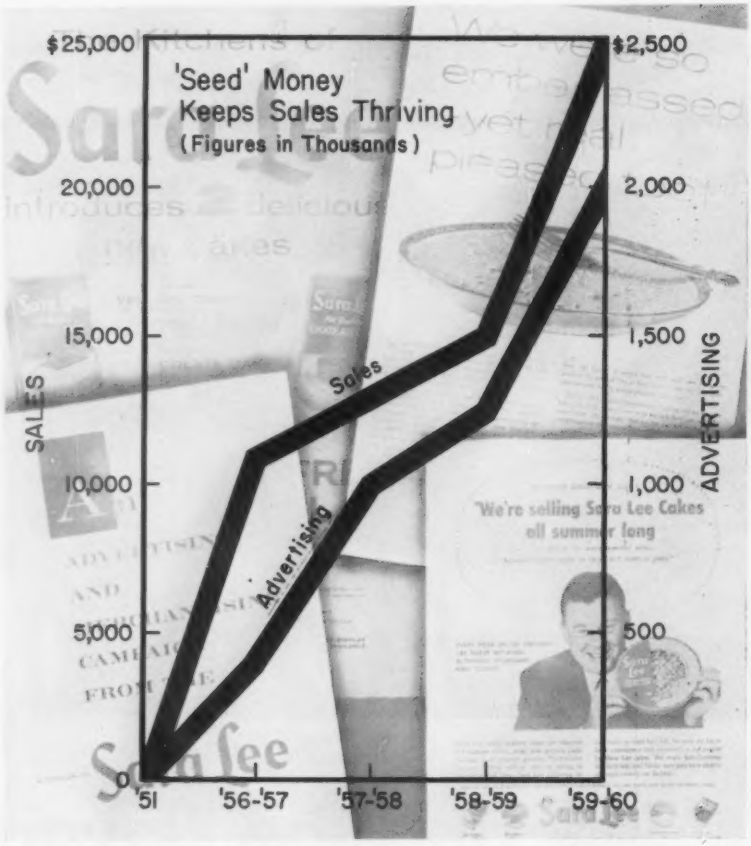
NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____



STRONG SUPPORTERS of ethical advertising, V. P. Kaplan (l.) and Ad Director Harris stress: "There's no place in food business for opportunistic practices. Case in point are 'deals' to achieve shortrun gains. Our objective: Broaden over-all product sales thru advertising."

STEPPED-UP PACE of competition is shown by Sara Lee's rising ad expenditures. Between '56 and '59, company's advertising as a share-of-sales rose from 3.6% to 8.0%. However, the beefed-up promotions helped SL to more than double its sales during the same 3-yr. span.

Sara Lee's R_X for

Ads That Get Results—Fast

Hustling baker doesn't stint on advertising budget—which take 8% of sales dollar . . . Big pay-off comes from shrewd focusing of media use, tight gearing of merchandising with over-all sales needs, and rigorous evaluation of ad outlays

EVALUATING ADVERTISING for greater effectiveness is a question that occupies top management more and more these days. That's because rising media costs, and the stepped-up pace of promotion, make it more urgent that the ad dollar does a productive job.

MANNY KAPLAN and KEN HARRIS
Marketing Vice President and Advertising Director, Kitchens of Sara Lee, Chicago

An effective advertising program must spring from, and successfully project, a company's basic marketing strategy. Obviously, it must pre-sell the consumer, since success ultimately depends on consumers continuing to buy your product. But it must also meet your sales requirements if it is to get the necessary support.

Behind Sara Lee's strong ad program, there is a time-proven formula we rely on to make sure that ad dollars are profitably spent. Namely, make sure that our advertising:

. . . is so highly creative that it expresses the premium quality story—and backs the production of the best cakes that can be made.

. . . achieves our immediate objectives. That is, what must make this program produce results soon?

In addition to stimulating consumer purchase, we ask: "Will it generate enthusiastic response from field sales personnel? Does it give our men imaginative display ideas for a better in-store merchandising job? Will it convince retail buyers to carry all nine of our products instead of only six or seven? Is it equally effective in all parts of the country?

Attaining these immediate objectives calls for proper timing. All Sara Lee ad campaigns are fully planned far in advance to allow the sales organization sufficient time to present it properly to the trade so that in-store merchandising can be arranged.

Another pressing reason for advance scheduling is the need to avoid out-of-stock conditions. Proof was a recent SL marketing survey that showed a major out-of-stock situation created by retailers who underestimated their customer's desire to purchase SL products as the result of ad and merchandising stimulation.

Sara Lee isn't interested in building a brand image where nothing happens for a long time and then, suddenly, everything does. We're for image-building advertising which makes sales crackle today, and lays the ground work for long-range drives

Getting It Rolling

As mentioned before, immediate results can't be accomplished unless the campaign is followed through from start to finish. Before a campaign assignment is given to our agency, we break out all the necessary sales, marketing, and promotional factors that make advertising an integral part of sales planning.

Major Sara Lee campaigns are initially kicked off at sales meetings, attended by our headquarters sales staff and field representatives. Purpose, of course, is to spark enthusiasm of our salesmen who, in turn, transmit this feeling to buyers and store personnel.

In a nutshell, this focuses the campaign on the store level. If handled in any other manner, advertising would merely serve as an abstraction, with its value lost through lack of follow through.

Our company uses national media, and is heavily involved in individual local market campaigns. National advertising is a continuing drive to hit the consuming public with the company's basic sales message that's necessary for all markets. Through national media, this message is economically conveyed to all markets.

Local markets are individually examined, since their needs and sales objectives vary. Hence, coordination of national and local market advertising—to reach our immediate objective — offers the sales organization the necessary tools for an effective job at every selling level.

In-store advertising is focused on getting more displays—even special ones — into supermarkets along with full-color point-of-sale material. Temporary displays are built around a specific selling theme that ties in with media advertising.

Special displays like the "Shopper-Stopper"—a wire stand for freezer cabinet with a full-color card — dramatize SL products. P-O-P material may, for example, consist of small, full-color channel cards illustrating such tie-ins as SL pound cake with frozen strawberries, or brownies with ice cream.

Evaluating the Campaign

To measure the effectiveness of our advertising dollars, we again ask ourselves: "What was the effect on sales? Were our sales force and customers excited? Did the campaign help our sales staff do a good in-store merchandising job?"

It's impossible to pin down, precisely, the sales results of our ad campaigns. That's because SL, in operating nationally, carries out so many types of advertising.

With us, advertising is a highly developed administrative function marked by close liaison with the agency.

To enable him to operate more efficiently, the advertising director is zeroed-in on all sales, marketing, and promotional plans. His activities are organized so that he has sufficient flexibility to make his ad dollars compete with large companies. Through such maneuverability, he's able to take advantage of special opportunities, hence get more per ad buck.

In the final analysis, spending advertising dollars calls for selectivity. For, running the right ads in the right media is almost like hiring the right salesman. Big difference is that advertising is more important, since it reaches more potential customers than an individual salesman can. (End)

How Packaging Fits In

All effective advertising campaigns begin with product quality. The ad may inspire the first sale, but the product must deliver the repeat sale. Charles Lubin (Sara Lee's founder and president) capsules his company's policy in this manner: "Make the best cakes that can be baked, promote them with intensive advertising and merchandising."

When starting out with SL, he realized that packaging materials used then by the baking field were inadequate. Cardboard and chipboard cartons, while functional for retail bakeries, couldn't meet his requirements. So, he targeted packaging materials that would:

1) Withstanding the rigors of long-haul shipment and rough handling in supermarkets.

2) Insure product freshness.

3) Reflect the quality atmosphere of SL cakes.

Developed, then, was a new concept in baked goods packaging—introduction of an aluminum tray now generally used throughout the field. From a production viewpoint, it was also important to sell the cakes in the same trays in which they were baked.

Behind this pioneering was Lubin's conviction that the consumer was prepared to pay a fair price for the very best—a higher price, even, than she was used to paying.

From the start, SL's advertising goal and selling effort has been to get the consumer to try its products. And each product line expansion has meant heavier ad investment to launch the new items. Because in each instance SL's sales objective were topped, total ad expense fell in line.

The company relies strongly on short-time, heavy-impact advertising. Example: SL products were introduced in New York in '55 with one of the heaviest concentrated ad campaigns ever to hit that area.

Ad program was designed, as stated, to get people to try the cakes. Continuity of this effort wasn't essential, because the original heavy impact created sales momentum that was nursed along by word-of-mouth advertising. Subsequently, each product introduction was so successful that it helped broaden overall sales of each variety of cake.—FE Editors.

Task-Designed Crown Lug Caps keep your product safer . . . your customer happier. The live rubber ring makes the big difference, because live rubber is Task-Designed for the job. Live rubber rings can take the heat of sterilization, and seal tightly despite minor irregularities in the glass. Live rubber rings make it easier for the housewife to remove and replace the lug cap—as often as necessary.

Investigate these other advantages of live rubber; longer shelf life . . . less rejects because of ability to withstand stacking pressures. May we send you more details?

CROWN *for cans · crowns · closures · machinery*

CROWN CORK & SEAL CO., INC., 9300 Ashton Rd., Philadelphia 36, Pa.

Are You Ready for Tomorrow?

A Challenge to Management

Look out for shifting tides in productivity, competitive advantage, and consumer desires. Dairy expert's strategy for the future can help you call the right signals in volume, labor, investment, personnel, research, and marketing

TODAY'S DAIRY PLANT manager, like any other industrial executive, must be of such caliber that he can foresee enough of the changes ahead to plan the future operations of his company successfully. It cannot be left to chance.

Some companies are headed by men who have become compiacent. Perhaps they hesitate to make drastic changes for fear they will be wrong.

Others are simply marking time until they can retire or sell out and enjoy the fruits of a lifetime of labor.

Then there are those who have become self-satisfied. They feel that their brand has been a leader in its field for so many years that consumers would not even consider using a competitor's item.

Finally, there are the ones who have failed to surround themselves with a team able to foresee the changes needed to keep abreast of changing times.

Whatever the reason, the end result will be the same—inability to survive because of failure to adjust to changing markets.

Good management today requires good thinking and careful preparation of company procedures. There are no short cuts to profits.

The days of clever dealing as the key to success in business are over. Only straight-forward planning to meet the needs of a highly competitive market, which demands quality at minimum prices, will suffice.

This calls for leadership of the highest caliber and possibly explains why the percentage of industrial managers that have college degrees is rapidly rising.

The entrepreneur of today must be well trained in social, economic, political, legal, and to a certain extent, mechanical skills.

Effect of Present Trends

Providing we do not get into a world war, the potential market for processed foodstuffs is tremendous. By the end of the next decade there will be 33,000,000 more people in the U. S. to be fed, clothed, housed, educated, and supplied with services. Rapid increases in population will occur the world over, which will have repercussions in both our foreign and domestic markets.

Proportion of old to young people is increasing. As a result, the percentage of the total population that is in the working class is becoming much smaller. This relatively smaller group, however, will have to produce more to supply, not only their own increasing needs, but also the wants of the larger group of the nonproductive members of society.

As a consequence, labor in the total food industry will have to become more productive. Goods produced per man-hour will have

P. H. TRACY

Dairy Industry Consultant

Dr. Tracy is professor emeritus in dairy technology at the University of Illinois. At present, he is living in De Land, Fla., carrying on research and consulting work for the industry.

in packaging

Weyerhaeuser

(Ware'-hous-er)

is pronounced

Ingenuity

(In-je-nu'-i-ti)

If there were a popular demand for autumn leaves, Weyerhaeuser Ingenuity would package them to give you a selling advantage.

Much more goes into Weyerhaeuser cartons than the contents they protect. Each represents the skills and experience of a large team of packaging specialists. From timber—grown as a crop—to merchandising excellence, every step of production is carefully planned to satisfy and economically meet the needs of each carton user.

Impelling design for high shelf-appeal, plus high-fidelity printing, gives Weyerhaeuser cartons the "quality look" that attracts self-service shoppers. Carton uniformity speeds filling and closing, reduces costly rejects. Shipments-as-promised enable users to maintain efficient production.

Working with Weyerhaeuser is a pleasing experience in carton ingenuity. We invite your challenging problems.

ASK FOR FREE BOOKLET

This informative "Ingenuity" booklet colorfully explains how Weyerhaeuser can service you. It shows not only how Weyerhaeuser works but what Weyerhaeuser will do for you.

Weyerhaeuser Company

Boxboard and Folding Carton Div.

Headquarters
919 N. Michigan Ave.,
Chicago 11, Ill.

Man-Hour Output Rises with Volume

Milk Handled (Gal.)	No. of Plants	Production Per Man-Hour (Gal.)
Under 13,000	9	53
13,001–25,000	22	76
25,001–50,000	5	90
Over 50,000	7	92

TABLE 1—Study shows progressive increase in man-hour output with larger total volume of production. Above man-hour figures are averages. Productivity rates actually varied from 28 to 125 gal.

to be increased. All business, therefore, will have to be operated on a strictly scientific basis in order to survive.

There are both small and relatively large businesses operating today because of some protecting "umbrella" such as: Low ingredient cost, high selling price, low labor costs, low rent, low tax rates, or limited competition.

But keep in mind that in a highly socialized state, where the philosophy is the greatest good for the greatest number, there will be no place for trade barriers such as exist in some markets. For example, milk produced in low cost areas such as Wisconsin and Minnesota is kept out of other areas where local producers enjoy a much higher price for their milk because of existing public health measures.

Advantages of low labor costs tend to be only temporary because of the greater mobility of labor today and the rapid movement toward organization—even agricultural workers.

When low tax rates exist in a community it is probably due to laxity in development of public schools, parks, and roads. These needs are soon realized by a younger and more progressive generation, and changes follow with the subsequent rise in taxes.

Management that becomes complacent because of the shelter from temporary economic umbrellas sooner or later will be in trouble. The only secure business is one built on sound economic principles adjusted to modern trends.

Changes Lie Ahead

People's wants change with their environment. The environment changes with evolution and with the development of industrial technocracy. Those in the food business need to watch these changes with care in order to better adjust their services and products to meet new requirements of the consumer.

Here are a few of the changes likely to be made in consumer demands in the near future:

► 1. More travel on our highways, which will result in a rapid growth of service industries, such as hotels, motels, restaurants, repair shops, beauty shops and barber shops.

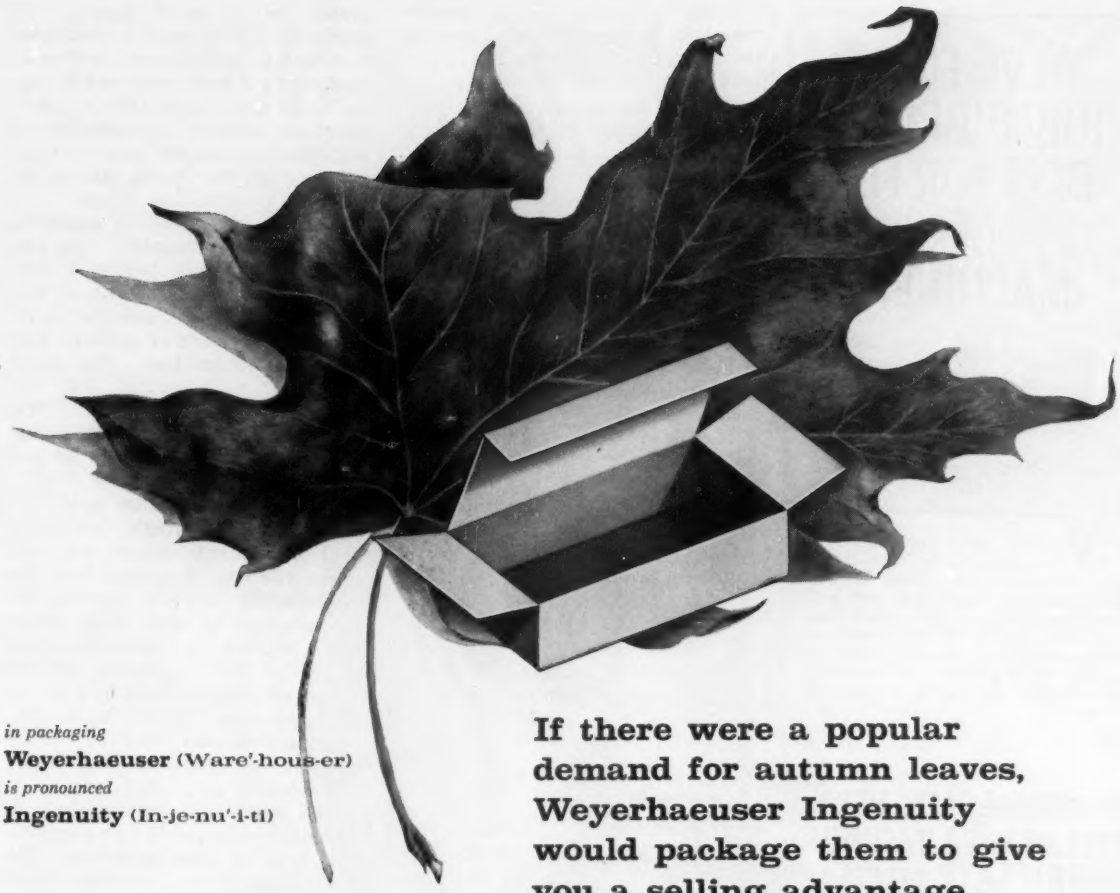
► 2. More leisure time will result in greater demand for cars and accessories, outdoor movies, camping equipment, boats, fishing tackle, golf clubs, and other athletic equipment.

► 3. Many new shopping areas, which will favor growth of chains of all kinds—food, clothing, shoes, drugs, hardware, liquor, and variety stores.

With continued increase in the percentage of married women working in industry, convenience goods will play an increasingly important part in our economic structure.

Any goods or services that minimize the home chores will be in great demand. This applies particularly to the food line. Ready prepared meals will increase in popularity. Quality sandwich spreads, salads, dips, and desserts will be in greater demand. Nonperishable items that can be taken on picnics and car trips will prove increasingly popular.

Specialized services will also be in demand, particularly by the smaller businessmen, who will find it more convenient and possibly



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Weyerhaeuser Company
Boxboard and Folding Carton Division

Headquarters: 919 North Michigan Avenue · Chicago 11, Illinois

"WE'VE FOUND THIS LUBRICANT BEST FOR FISH PROCESSING MACHINERY"

says HIGH SEAS Tuna Packing Co., Inc. of California

"We have used LUBRIPLATE Lubricants for over 15 years and find they do everything. They keep fish processing machinery from seizing and keep it easy to take apart and reassemble. This is very important in food processing plants. Because LUBRIPLATE Lubricants are so effective, economical and long-lasting, they save us time and money."

Earl Lockhart
Master Mechanic

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

cheaper to hire such help than to maintain a regular staff. Among the services of this type are:

1. Mailing and addressing
2. Mimeographing
3. Stenographic work
4. Deliveries and delivery equipment
5. Engineering
6. Quality control
7. Market surveys and research
8. Accounting
9. Sales and advertising programs
10. Public relations
11. Package designing
12. Employee training, both plant and sales
13. Byproduct manufacture—cultured milk products, cheese, cheese spreads, powdered milk products, sour cream, dips, ice cream novelties, and whipped cream.

These products will be made available to the milk and ice cream manufacturer, thus reducing his investment in plant and equipment and making it possible for him to streamline his major operations and place more emphasis on selling.

Automation a Must

The author is at present engaged in a study of dairy plant automation. Within the past two years nearly 100 milk and ice cream plants in all parts of the country have been surveyed as a preliminary phase of this study. Some of the data are shown in Tables I and II.

Productivity per man-hour in milk plants was found to vary from 28 to 125 gal., ice cream plants from 20 to 42 gal. You may wonder about the wide range in efficiency. Each plant presents its own problems, but in general low productivity can be attributed to one or more of the following factors:

1. Operation too small. Milk plants handling 100,000 lb. or more per day were in general more efficient than the smaller ones.

2. Obsolete equipment and layout. It takes courage and capital to close two or more plants and combine their operations in a new mechanized and automated one properly designed and located for maximum efficiency. However, this is a situation that must be faced to overcome excessive labor costs.

3. Too many operations in one plant. Automation can be better applied if the efforts are concentrated on a small number of products. For example, a plant specializing in bottled milk, half-and-half, and cultured milk, and bringing in its byproducts from another plant, can streamline manufacturing operations to better advantage because of the concentration of effort on high volume items.

4. Too many grades of products and types of containers. Big advantage of a plant having a captive market, which is one of the modern trends, is concentration of effort on one style of package and one grade of product. The more grades of milk bottled, and the more types of containers used, the lower the production per man-hour. The same is true of ice cream.

5. Failure to utilize available equipment and controls. One beautiful new plant visited was obsolete the day it opened because management failed to use the engineering skills that were available. Modern food plant planning is no job for amateurs. It requires concerted efforts of a group of specialists versed in design, construction, mechanics, electronics, and practical dairy plant operation.

The small businessman finds it difficult to survive in any competitive field of long standing. He usually paves the way for large scale operation. He develops new fields of endeavor and, when the large margins of profit disappear as the result of competition, large corporations move in. Through their greater skill as entrepreneurs and with larger working capital they are able to operate at a profit where the small operator found it difficult to survive.

This has happened to the automobile business, department, drug, and grocery stores, and is now taking place in the dairy, hotel, motel, and several other enterprises.

Transition from small to large, and from many to few, is a natural evolution in any industry, and there is little to be gained by trying to legislate against it. To do so would mean passing laws that would result in higher prices to consumers, and this is something few politicians are likely to propose openly.

Whether or not a business flourishing today will be profitable in 1970 will depend largely upon the ability of management's quarterbacks to call the right plays.

(Continued p 84)

Old King Cole is a merry old soul
And no wonder he feels that way
The foods and the cheeses that fill his bowl
Keep fresh with SORBISTAT®-K!

FOODS STAY FRESH and "fit for a king" far longer when protected with SORBISTAT-K (potassium sorbate, Pfizer). This safe, efficient inhibitor of mold and yeast growth has little or no effect on the taste, and is proving highly successful in a variety of modern food products.

Some examples: fresh fruit cocktails ▫ high moisture cake ▫ cake fillings and icings ▫ fruit pie fillings ▫ cheeses ▫ fountain fruit syrups ▫ chocolate syrups ▫ prepared salad ▫ pickles ▫ dietetic jams and jellies ▫ smoked and pickled fish ▫ wine ▫ dried fruits.

SORBISTAT-K is readily soluble in water. You can prepare up to 50% solutions for sprays, dips and metering.

FOR APPLICATIONS WHERE WATER SOLUBILITY IS NOT A FACTOR Pfizer now offers new, improved SORBISTAT® (sorbic acid, Pfizer). SORBISTAT is a free-flowing product that dissolves readily in oil and fat media and can be mixed easily in dry form with other dry food ingredients. It has an extremely low moisture content.

Please send me Technical Bulletin #101, "Sorbistat®—Sorbistat®-K" FE

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

Science for the world's well-being

Quality Ingredients for the Food Industry for Over a Century

Pfizer

Chas. Pfizer & Co., Inc., Chemical Sales Division, 630 Flushing Ave., Brooklyn 6, N. Y.

Branch Offices: Clifton, N. J.; Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Tex.; Montreal, Canada

Study Notes Wide Variations in Efficiency

Product	Plant A	B	C	D	E	F
	(Gal. per Man-Hour)					
Mix manufacture	218	150	173	260	223	258
Bulk	62	117	82	109	83	55
Half gallons	87	119	77	81	58	34
Pints and quarts	40	37	34	46	34	36
Total freezer	71	76	63	69	54	32
Brine tank novelties	—	10	13	16	23	15
Molds, cakes, etc.	—	20	14	—	5	1
Total ave.—direct labor	71	56	40	43	48	22
Total ave.—including indirect labor	47	36	32	31	38	19

TABLE II—Six plant survey illustrates big spread in production per man-hour among different ice cream plants. Reasons why include obsolete equipment, over-diversification of products and grades, and low-volume operations.

Business programming should include the following strategic moves:

1. Look over the umbrellas now protecting your business and calculate the length of time they probably will last.
2. Increase volume handled in each plant, and specialize operations in these plants to the greatest extent that is feasible.
3. Hire highly skilled and well trained executive personnel that are versed in all phases of management.
4. Mechanize and automate all plant, laboratory, and office operations to the fullest extent possible. This must be done on a continuing basis.
5. Develop a quality program that will, without exception, provide the consumer with uniformly high quality merchandise. However, do not depend upon quality alone to bring success to a business operation.
6. Maintain a research staff to work constantly to develop new products and to improve methods of processing. You may want to consider subletting a portion or all of your research activities to outside groups.
7. Work constantly to improve consumer acceptance through better service, better packages, better flavors, new varieties, and more convenient food products.
8. Plan to improve merchandising methods, keeping in mind that the average consumer has a limited amount of money to spend, and that there are thousands of items being offered for sale in addition to the few you are manufacturing. Competition from outside is just as important as from within.

The dairy field is selling the consumer primarily food solids—fat, proteins, and carbohydrates. Many other sources of these same food solids, some of which are cheaper than those supplied in milk, cream, butter, and cheese, are crowding the shelves of the supermarkets.

People must have food, but they also want radios, television sets, cars, boats, new home furnishings, and the like. This competition must be met, as well as that from fellow dairymen. To do this, management must manufacture efficiently and merchandise wisely.

Data, based on U. S. Department of Labor and Bureau of Labor statistics, indicates that milk is about half way between the highest (hospital rates) and the lowest (electricity) of the commodity cost increases since 1939. Although this record is good, dairymen should strive to make the comparison even more favorable in 1970.

Whether or not this goal is achieved will depend largely on the extent to which both farm and plant labor productivity is increased through improved mechanization and automation. Removing the drudgery from farm and plant work by automation will be necessary for another reason; that is, to attract workmen of the right caliber to the dairy industry. (End)

New Low Cost Chlorinated Water Supply FOR FOOD PROCESSING PLANTS

KLENZADE

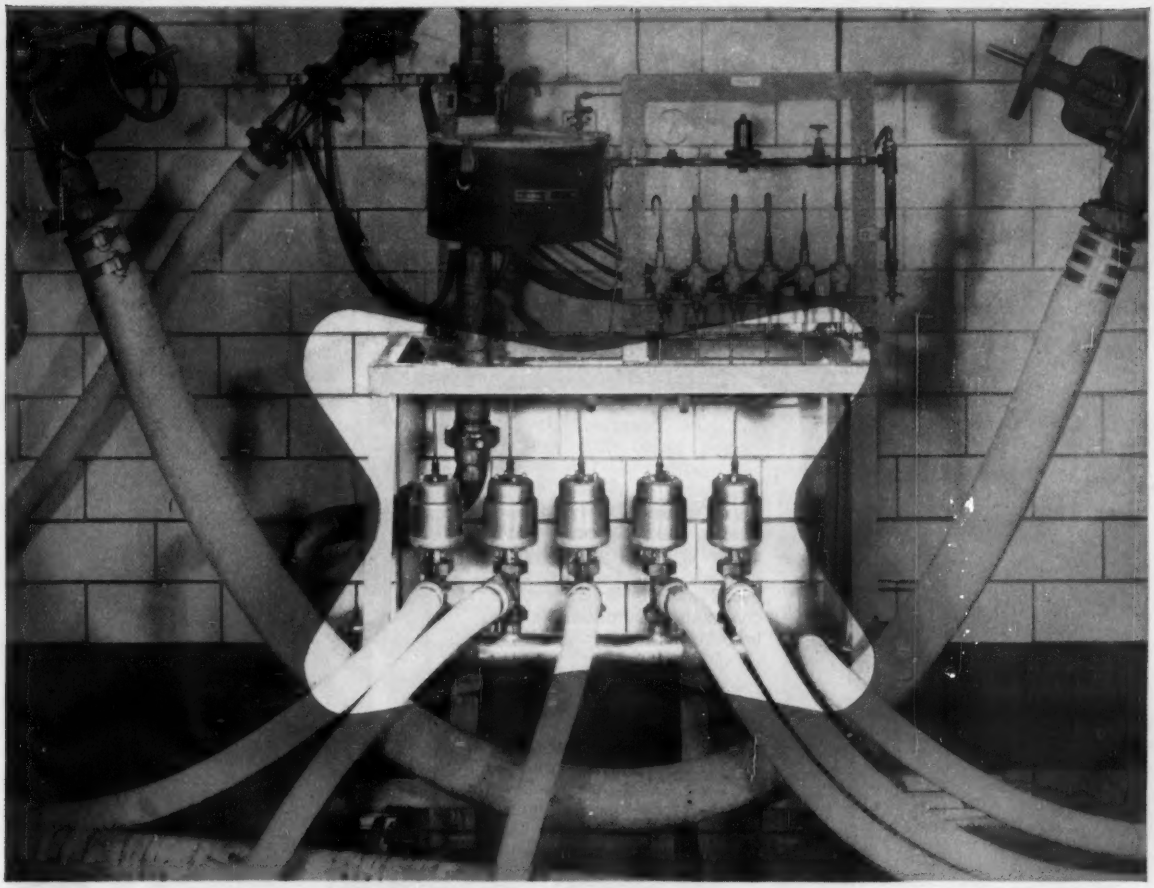
KLENZADE IN-PLANT WATER Chlorination

★ SIMPLE EQUIPMENT
★ LOW COST CHLORINE
★ "SPOT" LOCATION

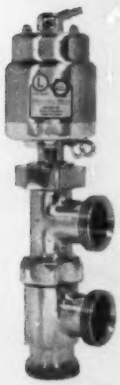
Completely automatic feeding of Klenzade XY-12 Liquid Sodium Hypochlorite into your water line with a %Proportioneers% Heavy Duty Midget Chlor-O-Feeder. Low initial equipment costs, simple installation for any section or entire plant system. No skilled operator needed, no gas risks, no maintenance of elaborate equipment. Solution strength easily adjusted for clean-up time. Get the facts on this popular Klenzade "Package" and why it is ideally suited for your food processing operations.

COMPLETE Sanitation Programs

Branch Offices in Principal Cities
KLENZADE PRODUCTS, INC.
BELOIT, WISCONSIN



How Miller Brewing Company utilizes automatic valves to measure clarity of filtered beer



Ask your nearest Tri-Clover distributor about the complete line of air actuated valves for fast, automated flow control to reduce processing costs, increase worker output and improve inventory control.

Miller Brewing Company and Ladish Co., Tri-Clover Division engineers recently worked out a better way to measure and record the clarity of famous Miller "High Life" beer . . . by using five air actuated valves to automatically control product flow from the filters. A "Turbidity Meter" monitors the lines by signaling for shut-off of the valve at the first sign of filter build-up.

The result: Miller Brewing Company is now assured of direct, positive and automatic measuring of one of their most valuable "properties"—the *clarity* of the "Champagne of Bottle Beer." With this type of installation, Miller Brewing Company is in a position to exercise the most exacting control of the clarity of the beer.

This is a good example of how experienced Tri-Clover engineers can translate the exclusive design features of "Fesco-type" air actuated valves into opportunities for greater profit for you . . . through automated flow control.

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14 NEW UNITS AT PACKERS SHOW

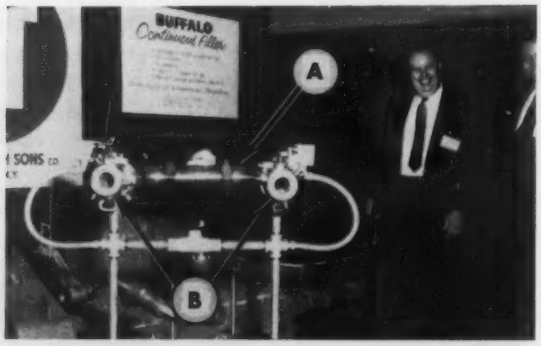
Advanced equipment for emulsifying, pumping, filling, packaging, cutting, dispensing, and brinemaking displayed at Chicago AMI exhibit

2 Continuous Emulsifiers

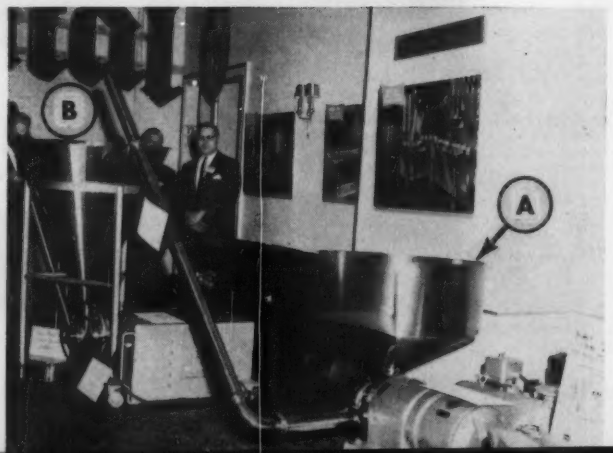
STATIONARY UNIT, with low hopper, takes product from cutter or mixer to eliminate handling. Dual-discharge cock eases transfer to stuffer for continuous operation. — Allbright-Nell Co., Chicago. (471)

PORTABLE emulsifier features low hopper into which sausage meat is readily dumped. Unit transfers product directly to continuous stuffer. — Griffith Laboratories, Chicago. (472)

2 New Pump Stuffers

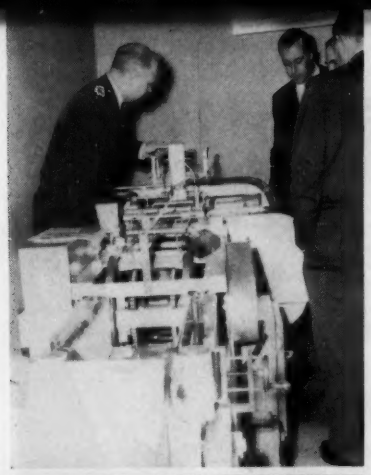


DUAL SYSTEM continuously emulsifies (A) meat, pumps it to filler (B). Latter is adaptable to filling casings, or to patty-forming, chub-packaging, and canning machines. Remote control governs product flow.—John E. Smith's Sons Co., Buffalo, N. Y. (473)



COMBINATION transfer-stuffing pumps automate stuffing. Product discharges from emulsifier into transfer pump's hopper (A). Then, it is pumped into pump stuffer's hopper (B) for stuffing through single or twin horns.—Anderson Bros. Mfg. Co., Rockford, Ill. (474)

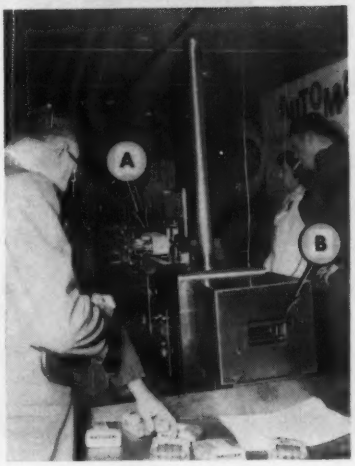
4 Advanced Packagers



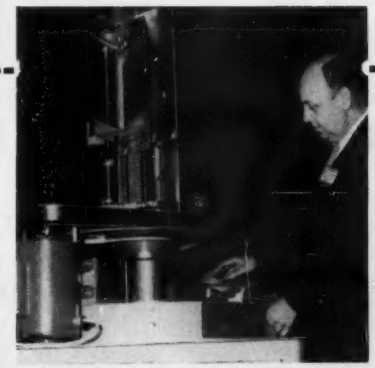
BACON packager inserts pre-weighed slices (on paperboard) into resin-coated, window-type cartons that are machine formed. Glue is roller applied as carton goes through compression belt. —Packers Package, Inc., Muncie, Ind. (475)

WEIGHT BRANDER (arrow) uses pulse-digital technique to imprint weights (or codes) on conveyor-fed packages at 600 per hr.—Wilson Automation Co., Detroit. (476)

PORTABLE UNIT heat seals thermoplastic-lined tray around vacuum-pouch-packed sliced luncheon meats at 50 per min. Package adds brand and product identification, retains product visibility. — Marathon Div. (American Can Co.), Menasha, Wis. (477)



CONTINUOUS line (A) wraps double-stacked franks (1 lb.) in Cryovac film at 45 per min. Package goes through water-shrink tunnel (B) with 4-sided rollers.—Hayssen Mfg. Co., Sheboygan, Wis. (478), and W. R. Grace & Co., Cambridge, Mass. (479)



ELECTRONIC slicer changes thickness during operation, counts 1-16 slices, handles luncheon meats and related items.—Great Lakes Stamp & Mfg. Co., Chicago. (481)

3 Latest Cutters

PORTION CUTTER slices and deposits bacon, chicken, fish, etc. into conveyed cans at 300 per min. Fully enclosed unit adjusts for slice thickness, can size.—General Machinery Corp., Sheboygan, Wis. (480)

Other Highlights

ELECTRONIC DISPENSER sprays precise amounts of additives (ascorbic acid, MSG, etc.) onto conveyed items. — Scientific Dispensing Co., Chicago. (483)

PUMP-TYPE STUFFER has speed control for efficient stuffing of varying-consistency emulsions through single horn at 9,000 lb. per hr. — De Laval Pacific Co., Millbrae, Calif. (484)

BRINEMAKER circulates water through lower salt bed, separates and collects saturated brine. — Morton Salt Co., Chicago. (485)

ELECTRIC unit forms dices or strips of raw, cooked, or frozen meats at 250 lb. per hr.; also handles produce. Twin-feed funnels work semi-continuously. Werner Mfg. Co., Yale, Mich. (482)

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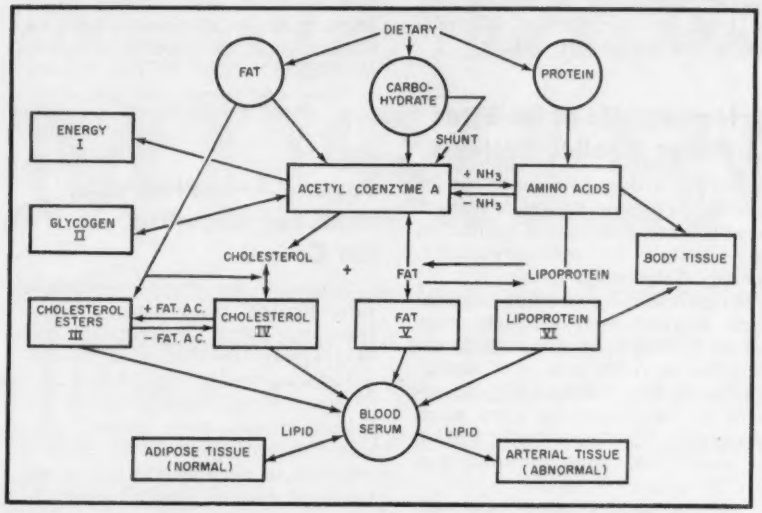
19-60

Advances in Technology



SCHEMATIC DIAGRAM involves at least 6 factors in the lipid carrying capacity of blood serum: 1) the total calories expended as mechanical energy and thus not available for conversion to lipid; 2) the fat, cholesterol and glycogen storing capacity of the liver; 3) the synthesis rate of cholesterol esters; 4) the synthesis rate of cholesterol; 5) the synthesis rate of fat (fatty acids, triglycerides, and phospholipids); and 6) the synthesis rate of lipoproteins.

Dietary Fats in Human Nutrition Is Vital Concern of Food Processors

The role of fats in human nutrition is the fat and oil industry's responsibility in supplying fats of high nutritional value. It is also the food manufacturers' responsibility in processing foods with these highly nutrient fats.

Dietary fats represent the most compact chemical energy available to man. They contain twice the caloric value of an equivalent weight of sugar. However, these fats are not solely providers of unwanted calories since they are as vital to cell structure and biological function as protein.

Consumption of high fat foods should be balanced with adequate protein and vitamin intake to provide the lipotropic factors necessary for normal fat metabolism. Controlling the total caloric intake may be better than resorting to semi-starvation or drastically decreasing dietary fat intake. Such actions could result in greater hunger pangs and an actual increase in total caloric intake.

If excess calories from carbohydrates are converted to fat *in vivo*, obesity cannot be controlled under an increase in total caloric intake. The problem could be solved by a curtailed intake of a diet which includes meat, milk, eggs, vegetables, fruits, sufficient cereals and bread to provide adequate protein, vitamin, and caloric intake.

Dietary fats furnish the essential linoleic acid necessary for a structural and functional role in animal tissue. Although the optimum total intake of linoleic acid by man has not been established, it is evident that the level of intake in the American diet could be increased. Much research on lipid metabolism is needed before sound conclusions can be reached regarding fats in human diet.

Indiscriminate substitution of soft for hard fats seems undesirable. An excess consumption of highly unsaturated fatty acids may change the functional value of the triglycerides in the depot fats. This may put an undue stress on the available *in vivo* antioxidant supply.—*Jour. of American Oil Chemists*, 503-509, Oct., 1960.

Coffee's Chlorogenic Acid A Quality Index

Chlorogenic acid occurs in coffee at levels of 3 to 8% depending on the quality of the beans. It can be determined readily by paper chromatography of an aqueous extract of ground raw or roasted beans, using butanol-glacial-acetic-acid-water (40:10:50) as the solvent.

Under ultraviolet light the chlorogenic acid spot has a strong blue fluorescence. The spot on the paper is cut out, the chlorogenic acid is eluted from it with water, and determined colorimetrically. A raw Congo coffee by this method shows 4.77% chlorogenic acid (dry basis), a Santos 1.81.

The chlorogenic acid content of coffee is a good quality index and might well be used as a specification in purchasing or in comparison of offering and delivery samples. The reduction in chlorogenic acid in roasting can also act as a quality index and a control of the roasting process.—*Fermentatio* (Flemish), 11-21, Jan., 1960.

Microbiological Assay for Thiamine Evaluated

While microbiological assays of fortified and other foods for thiamine have been largely supplanted by chemical methods of analysis, the sensitivity and ease of preparation of samples for the microbiological assay are advantages.

In addition to the use of *Lactobacillus fermenti* 36 and bakers' yeast for the assay, it has recently (1957) been shown that *Lactobacillus viridescens* is sufficiently specific for thiamine and capable of detecting lower concentrations than *L. fermenti* or chemical assay.

The concentration of the bacterial cells can be readily determined by turbidity measurements at 580 mmu after 16 to 18 hr. of incubation at 30C. Recovery tests ranged from 95.3 to 103.7% in enriched macaroni and breads and in fortified milk.

There was no significant difference between the results of thiochrome assay for thiamine and a *L. viridescens* assay. For products enriched with thamine hydrochloride or mononitrate, the *L. viridescens* assay is recommended since

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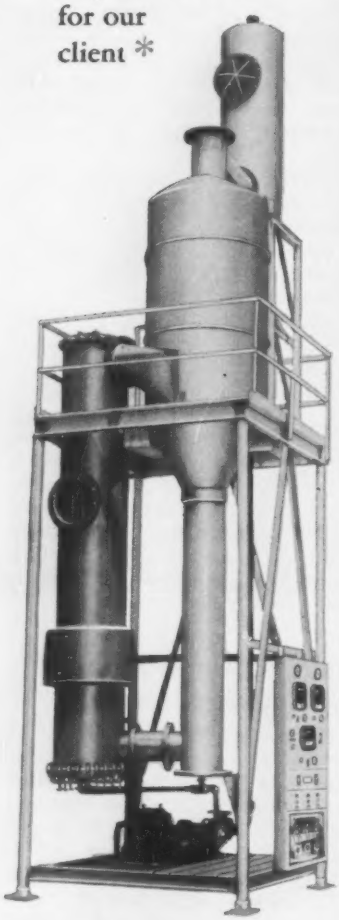

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simple extraction techniques can be used for it.—*Applied Microbiology*, 209-211, April, 1960.

Extending Life of Inhibitor In Water Cooling Systems

Sodium nitrite as a corrosion inhibitor in cooling waters is subject to attack and destruction (oxidation to nitrate) by microorganisms, usually *Nitrobacter agilis*.

In an effort to prevent destruction, a number of products were added to $NaNo_2$ in shake flasks inoculated with 10^9 cells of *N. agilis*. Ten were effective enough to warrant further tests in pilot plant cooling system charged with 9 liters of water, 500 ppm. inhibitor and 2×10^7 cells of *N. agilis*.

Sodium nitrite alone was exhausted in 20 days or less, $ZnSO_4$ stabilized the solution for 44 days, streptomycin prevented complete nitrite loss for 40 days. Sodium azide (10 ppm.) retarded oxidation to nitrate, and zero concentration of nitrite was not reached until 43 days after inoculation. Preventol GDC stabilized the cooling water for 31 days.—*Applied Microbiology* 7(5), 292-300, Sept. 1959.

Gas Chromatographic Study of Fruit Ripening

Ethylene has long been used to stimulate the ripening of fruit held in storage. It is known that many ripening fruits produce ethylene during the ripening period. Gas chromatography offers an improved means of assessing the gas phenomena occurring during ripening of fruit. The method has been applied to samples of air from apple storage rooms during the 1958-1959 season.

Edward VII apples were used for the test and a flame ionization detector type of gas chromatograph was used for analysis of the air samples from the storage rooms. Apples stored in atmospheres of varying CO_2 concentrations showed that high CO_2 levels retard ethylene production more than they do CO_2 production.

At 0.5% CO_2, ethylene production reached about 20 mcgm./kg./hr. after 60 to 70 days of storage; in 8 to 9% CO_2, only about 5 mcgm. of ethylene per kg. of fruit/hr. was produced. Keeping the apples at room temperature for a week prior to storage caused an abnormally high rate of ethylene production.—*Jour. of the Science of Food and Agric.*, 381-385, July, 1960.

Paper Chromatography Used for Sugars in Ice Cream

Sugars in ice cream were separated by descending paper chromatography, using an irrigation solvent system consisting of n-butanol:ethanol:water (2:1:1 v/v).

Paper strips containing the resolved sugars were eluted with water. Quantitative determinations were made photometrically on aliquots of eluates reacted with anthrone reagent.

No preliminary treatment of ice cream was necessary except dilution with water. The following sugars could be resolved on a single chromatographic strip: Fructose, glucose, galactose, sucrose, maltose, lactose, and higher sugars.

Four sugars, glucose, sucrose, maltose, and lactose, formed distinct spots when an ice cream containing corn syrup was analyzed. Recoveries ranging from 93 to 104% and averaging close to 100% indicate a fair degree of reliability of the technique.—*Jour. of Dairy Science*, 1031-1041, Aug., 1960.

Sour Pit Disease Linked to Yeasts

Sour pit is a disease of peaches in which there is abnormal softening of the stem-end cavity. Adjacent fleshy parts of the fruit are light brown, water-soaked and slimy, and a yeasty or sour odor is present. A yeast-like organism can be isolated from such fruits and similar organisms can be obtained from the fruit flies always in the vicinity at canning time.

Experiments showed that typical sour pit injury could be induced in damaged peaches (cut, bruised, plugs removed), by yeast isolated from injured peaches, or from fruit flies (*Drosophila melanogaster*). The yeast is a genus of the species *Torulopsis* and appears to be similar to if not identical with *Torulopsis inconspicua*. — *Applied Microbiology*, 256-261, April, 1960.

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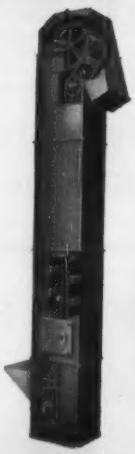

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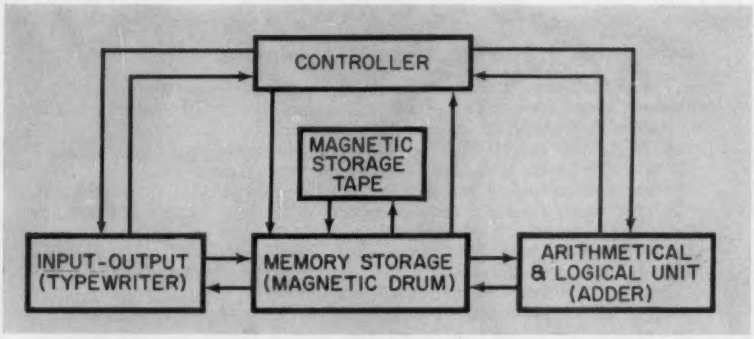


HEART OF G-15 is diagrammed here. Program and data information are read in from punched tape by either programmed command or typewriter instructions (photo at right) at a rate of 250 characters/sec., relieving personnel of heavy statistical detail.

Computer Speeds Container R&D

Compact unit handles mountains of statistics in a hurry at American Can's research lab. Double-quick answers aid development of new packaging ideas

FASTER R&D may actually be possible at lower cost in your lab through the use of an electronic digital computer. It is at American Can Co.'s plant in Maywood, Ill., where this tool is providing the latest in statistical techniques.

With the introduction of speedier instrumental analytical techniques and testing equipment to satisfy the mounting need for extensive research geared toward better products, packages, and processing methods, most R&D centers are swamped with data.

But at Canco, a compact computer (Bendix Corp. G-15) now solves complicated mathematical problems at fantastically faster speeds. It solves, in minutes, problems that might require a team of researchers considerably longer to work out using standard methods.

What's equally attractive is the unit's comparatively low cost. It sells for about $50,000 or can be rented for about $1,500/month.

Aside from the Maywood lab's data, computer also handles paperwork relayed from firm's Barrington, Ill., research lab, as well as technical data furnished by other divisions and subsidiaries. It's coming up with answers on container and packaging material specs for the purchasing department; on modifications of container design and quality control for manufacturing; and on problems relating to graphic arts and design of equipment at the Marathon Div.'s food carton operation.

During the computer's 6-mo. of operation, Canco has already prepared 32 program tapes (punched paper). And these tapes have been fed to the computer to evaluate statistical data relating to:

► **Taste panel tests.** Computer is handling up to seven variables and up to 90 samples per variable. It's electrically typing out F values, least significant differences at 1 and 5% levels, and averages of these variables.

For the Maywood taste panel group, the computer is handling, for example, data stemming from food packers' quality problems that may involve tracing the source of a product's off-flavor or off-odor. Computer is pinpointing trouble sources either to raw materials, accidental contaminants, or even preparation techniques.

Computer aids Barrington taste testers in evaluating new resin formulations going into containers as well as new plastic-type packages and application of new or modified food packages.

► **Animal feeding tests.** Canco has been routine testing can enamels for years to obtain complete proof of their harmlessness. Most sensitive tests involve statistical analysis of animal body weights, food consumption, blood checks, weights of vital organs, and pathological and histological examinations of tissues.

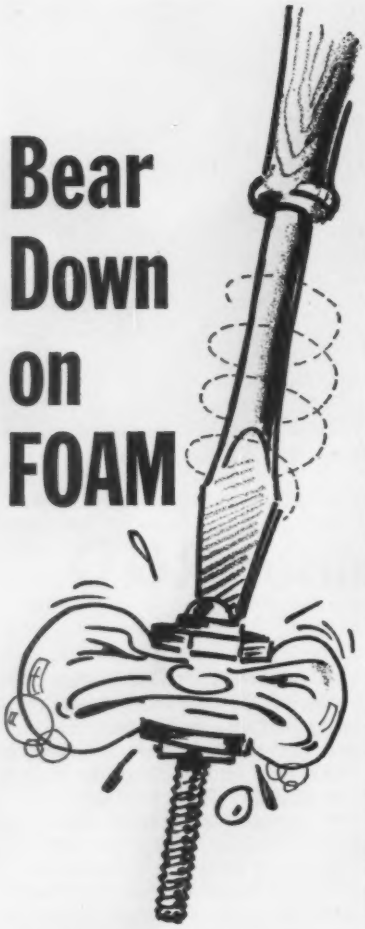
Big stumbling block is the mass of data that is accumulated for statistical treatment. Data that formerly required all day to calculate are now computer-processed within a ½ hr. And researchers are sooner able to plan their next course of action.

► **Organic coating scores.** Computer, for the first time, permits use of statistical methods in the evaluation of organic coating-test methods. It solves problems relating to enamel coating weights on sheets, new or modified coatings, coating adhesion, and can corrosion. Coating graders are given statistical results in 20 min. instead of 3 hr.

► **Coating thickness.** Just developed by Canco is a simple, rapid gauge for measuring coating thickness. Computer-fed data results have shown that the new method is superior and more accurate than the time-taking weigh-

G. B. PRATT
Sr. Research Chemist, American Can Co., Barrington, Ill.

Bear Down on FOAM



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Computer's Features and Operation

The digital computer is a powerful, internally programmed unit of medium speed computing system in a single cabinet. Unit's versatile in operation and compact in size (22x24x60-in.).

A 20-channel magnetic drum provides internal storage, with external storage offered by a built-in, searchable photoelectric reader for a 5-channel alphanumerical punch tape (for setting up programs). A 300,000-word (per reel) magnetic tape accessory may, if necessary, supplement the drum's memory. Information can be read into one of the drum's channels either from the photoelectric reader or from magnetic tape while internal computation is progressing.

Program and data information are read into the computer from punched tape by either programmed command or typewriter instructions at a rate of 250 characters (five binary digits per character) per second.

Printing speed (onto typewriter) is 10 characters per second and standard punching speed is 20. After an output process has been initiated by programmed command, computation resumes and continues during output process. Computation is interrupted only if another output command reaches the program prior to the end of the last output process (which seldom occurs with properly planned programs).

Most time-consuming task is setting up a program for the computer. But once set up on punch tape, the computer reads out at a rate of 100 words per second. Program—a mathematical model or formula—then tells the computer what to do.

ing technique. New gauge will enable more intensification on controlling quality (through better control over coating thickness and continuity) to improve service life performance of containers.

► **Can corrosion.** Computer shows its worth here in two ways. Evaluation and correlation data is enabling researchers to select more readily the various test methods such as accelerated storage test and the speedier physical and chemical methods.

Secondly, unit is processing old data to permit re-researchers to get a new insight on the course of can corrosion and draw inferences heretofore impossible to make.

► **New containers.** Computer is evaluating differences in aluminum containers produced from modified dies. Also being investigated are new styles and types of tin cans that arise from varying the container's physical dimensions or employing components made from plastic, paper, foil, or combinations.

► **Paper tests.** Here, the package-testing section is putting the computer through its paces in an effort to maintain closer correlation of test results between its own lab and those of suppliers on paper stiffness, caliper, basis weight, crush, sizing, etc. This analysis of variance is aimed at not only spotting errors but has an ultimate objective of maintaining tighter control in basic raw material properties to produce better quality packages at a saving.

Helps Can-Maker, Too

Engineering shares computer's use in researching can construction operations such as:

. . . **Side-seam welding.** This technique has been studied as a means of strengthening cans as well as improving appearance and performance. And the computer helps in designing electrical components for welding equipment.

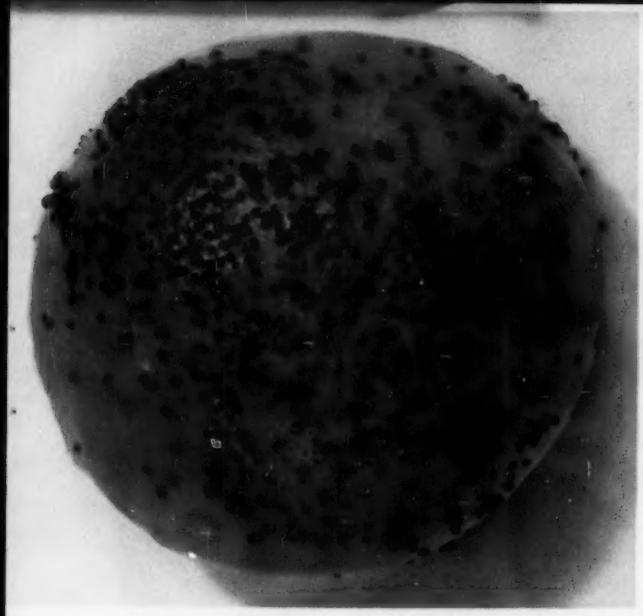
. . . **Can beading.** In its effort to hold down container costs and increase can strength, Canco is searching for the most effective techniques. The computer assists via its ability to predict bead designs in non-manufactured containers. Until now, major problem involved costly setting up of various bead designs and then going through the slow process of making up experimental cans for evaluation.

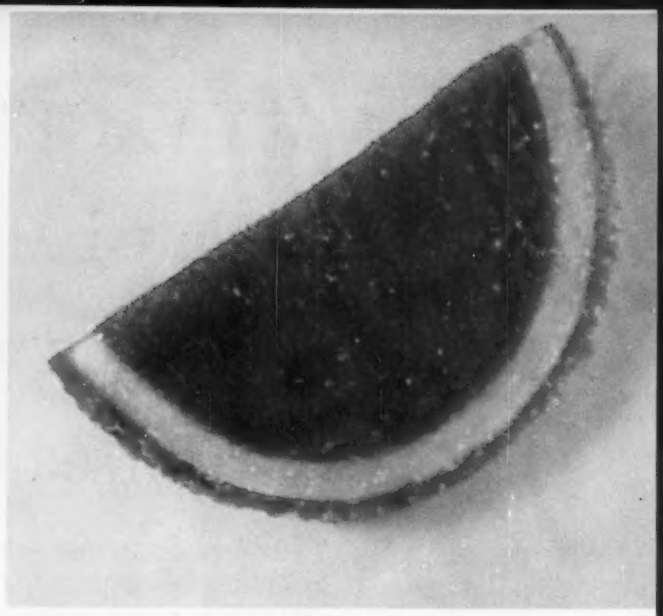
. . . **Temper and thickness of steel plate.** A computer program has been set up to predict can buckling and paneling pressures with changes in plate temper and thickness. Findings would permit can-maker to set up different safety factors at dollar savings and at the same time eliminate sources of packing difficulties.

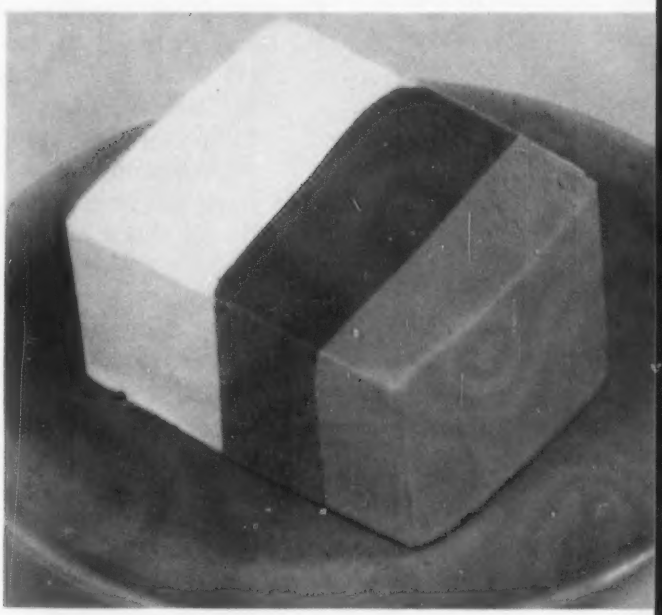
In the idea stage is use of the computer in designing better can-making and seaming machines. And Canco is even eyeing the possibility of using the unit to help improve the design and functioning of carton-making equipment.

(End)

CIRCLE 95 ON READER SERVICE CARD ➔







Flavorful, quality, eye-appealing foods...

naturally superior...when made with...

sugars, starches and syrups from

INDUSTRIAL DIVISION
CORN PRODUCTS
COMPANY

WRITE OR PHONE *Corn Products for expert technical assistance...*
helpful data on these fine products for the Food Industry;
CERELOSE® dextrose sugar · REX® and GLOBE® corn syrups · BUFFALO® · HUDSON RIVER® and SNOWFLAKE® starches.

CORN PRODUCTS COMPANY INDUSTRIAL DIVISION · 10 East 56 Street, New York 22, N. Y.

MYVACET® Distilled Acetylated Monoglycerides are now approved for edible use

These products, whose research studies have disclosed many interesting properties, are now ready for your new product development program. Sec. 121.1018, U. S. Food and Drug Regulations, authorizes their use, up to 5% in finished food, as

"(1) A food coating agent
(2) A food container component
(3) An equipment lubricant
(4) An emulsifier in food."

We have prepared Bulletin A-1 to give general information on this subject; included are a list of 69 pertinent scientific papers and patents and a compilation of many suggested uses. These range from slab oils to shortenings, and include coatings for foods as well as plasticizers for other coating materials.

Other bulletins are now available which give information on specific applications:

A-2. Poultry
A-3. Frozen and Processed Meats
A-4. Frozen Fish
A-5. Dried Fruits
A-6. Nuts and Candies
A-7. Storage Eggs

Food processors are welcome to copies of these bulletins, as well as samples of different types of *MYVACET Distilled Acetylated Monoglycerides.*

Information and quotations from ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

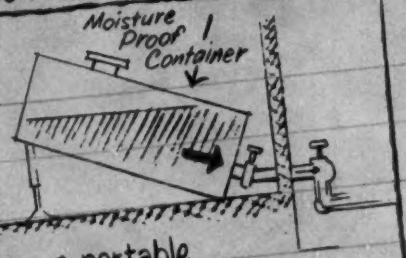
distillers of monoglycerides made from natural fats and oils

DPi

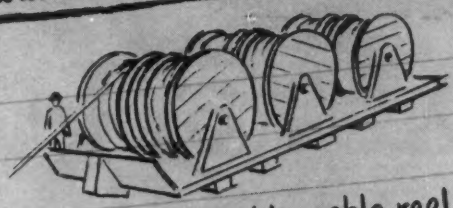
Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

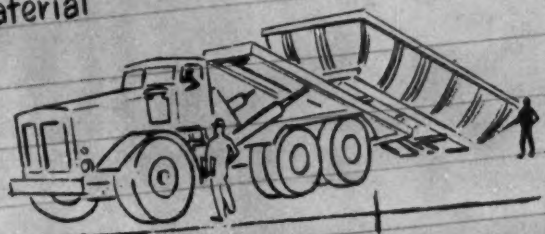
Materials Handling Ideas with the Dempster Dinosaur



Use as a portable Hopper for temporary storage of wet or dry material

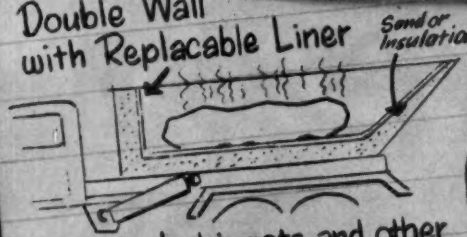


Use as a portable cable reel station - or for handling rolls of paper or steel

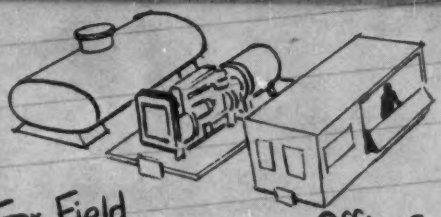


Shift heavy in-plant movements from rails to rubber with Dinosaur and 100,000 lb. capacity trucks... For slag... ingots... stone or chemicals.

Double Wall with Replacable Liner



Handle hot ingots and other materials with insulated containers.



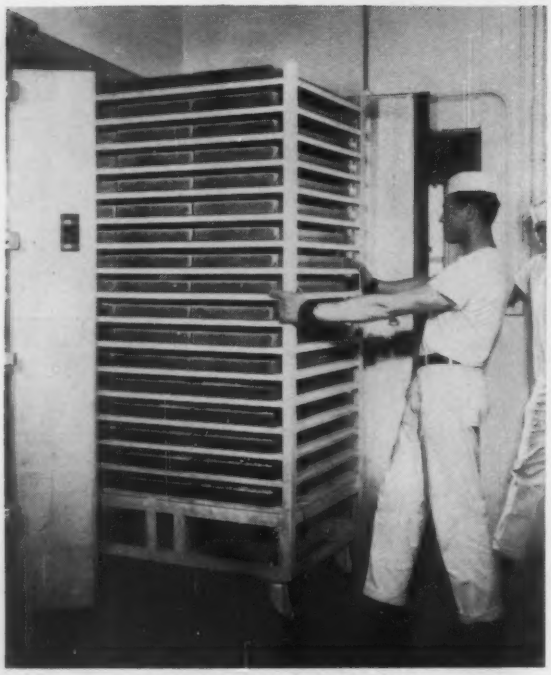
For Field Operations Portable Offices, Tool Sheds, Generators, Fuel Tanks, Compressors etc. can be moved to the site by the Dinosaur.

DEMPSTER BROTHERS offers a New Dinosaur Brochure, Free on Request

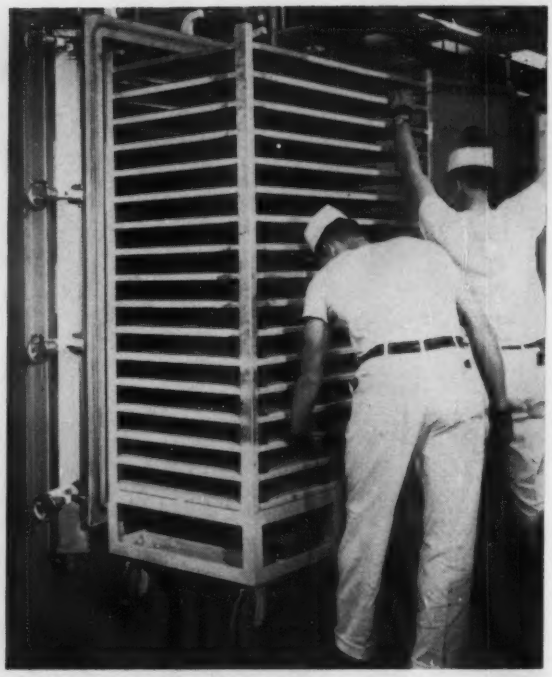
DEMPSTER BROTHERS
Inc.
Knoxville 17, Tenn. Dept. FE-11.

The DEMPSTER DINOSAUR®

CIRCLE 97 ON READER SERVICE CARD



INITIAL STEP is freezing of mushroom slices. Trays of frozen product on this multi-tiered cart are wheeled to . . .



. . . **FREEZE-DRYING CHAMBER,** where trays are quickly slid onto matching shelves of unit. For rigid control . . .

Freeze Drying Makes

Now Lipton uses low-temperature technique to boost quality of dry soup ingredients . . . Process and economic factors cited

LARGE-SCALE PROCESSING of freeze-dried chicken and mushroom has been under way at Thomas J. Lipton's Albion, N. Y., plant since early 1960.

The new products are used as ingredients of two of the company's dry soup mixes which, for the first time in wide distribution, will contain chunks of tender chicken and sliced mushroom.

Test marketing of the freeze-dried products began in 1959.

In contrast, similar-size pieces of chicken and mushroom slices would be too tough if dried by conventional means. It was primarily for this quality factor that Lipton turned to freeze-drying, despite the somewhat higher processing cost.

Pertinent steps in the freeze-drying of mushroom slices are illustrated above. Equipment for the Albion plant was supplied by F. J. Stokes Corp., Philadelphia, a pioneer in the development of freeze-drying systems.

Key to the process is the fact that ice sublimes at low temperature and pressure, thus it is converted from a solid to a vapor without melting. In operation, foods are first frozen, then dehydrated under high vacuum (FE June '59, p. 78; Jan. '58, p. 110).

Freezing provides a rigid structure that curbs product contraction and toughening, usually characteristic of other drying techniques. Moisture removal at low temperature leaves a sponge-like product with about 98% solids that reportedly reconstitutes to near original texture, flavor and color.

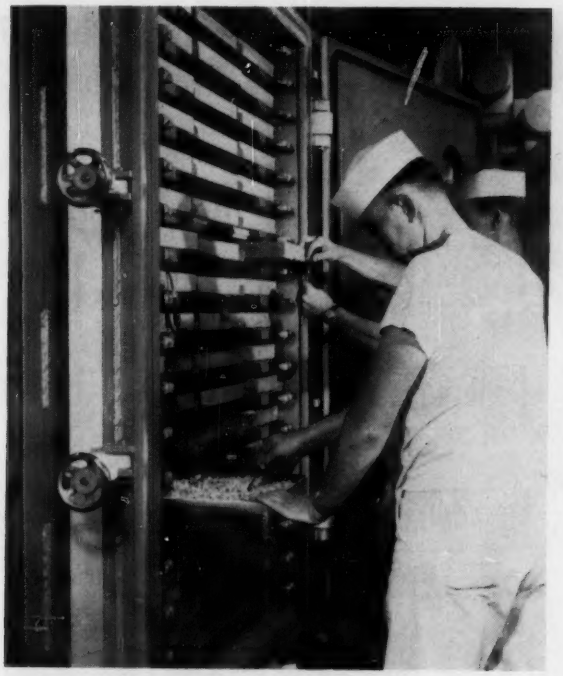
Critical process factors include freezing rate and vapor removal.

Slow freezing induces large crystal growth, which may fracture fibers or cells. This causes toughness in some reconstituted products.

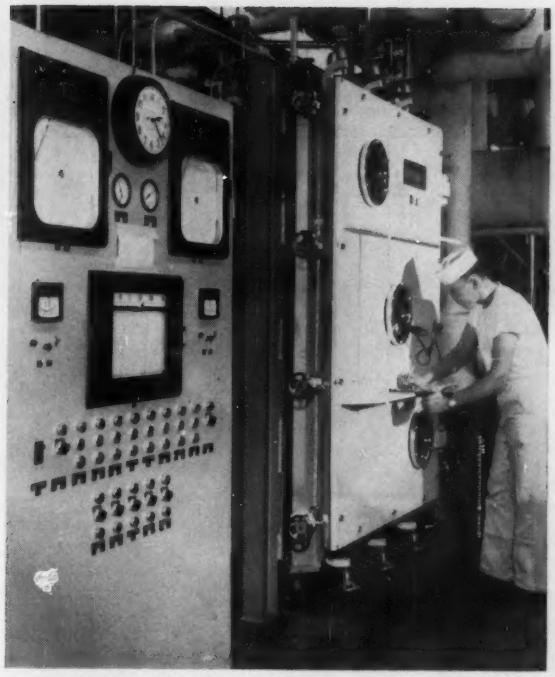
As drying proceeds, emitted vapors must be removed immediately and uniformly. Otherwise, areas of high vapor pressure develop around the product and localized melting may occur.

Lipton's thinking on the economics of the process, according to E. Seltzer, Asst. Director of Research, is that freeze-drying is justified when:

LEONARD TRAUBERMAN
Associate Editor, "Food Engineering"



. . . **THERMOCOUPLES** are 'buried' in mushrooms at four locations. Their leads transmit vital process data to . . .



. . . **RECORDING THERMOGRAPHS** on compact control panel that serve two adjoining chambers. Operator checks batch.

New Production Strides

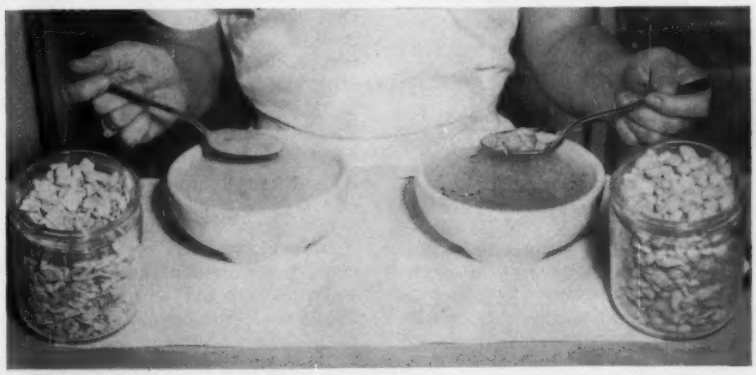
1. Products so dried are of conspicuously higher quality than can be achieved by conventional methods, and

2. Value of the dry solids in raw material to be processed is sufficiently high so as to make the cost of freeze-drying a reasonably small percentage of final total cost.

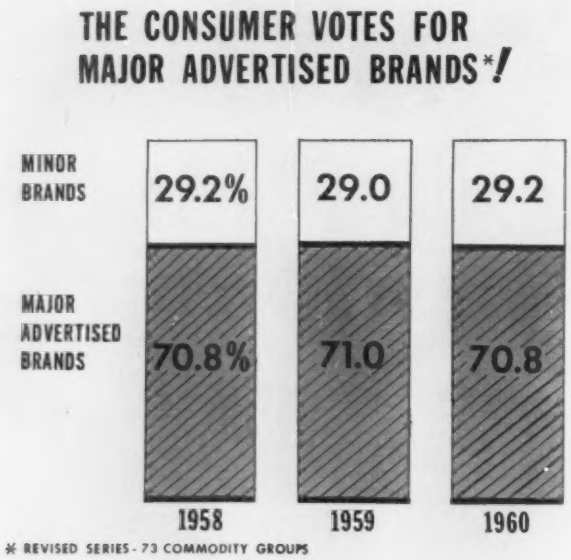
Looking ahead to mechanical developments that could greatly expand the commercial use of freeze-drying, processors seek sharp reductions both in equipment cost and drying cycle. The former would permit processing of relatively inexpensive foods by cutting the expense of a long drying cycle. The latter aims at cost reduction through shorter drying cycles made possible by new technology in accelerating heat input without hazarding the frozen condition.

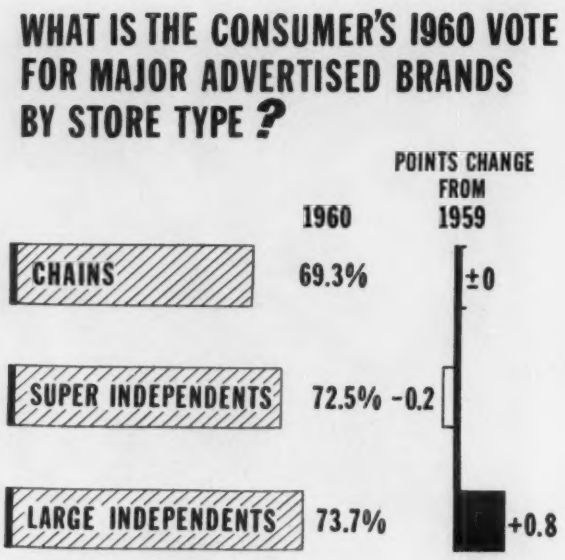
Recognizing these problems, F. J. Stokes Corp. reportedly has developed a new approach to accelerated drying that may cut operating costs to 2½-3½ cents per pound of water removed.

Meanwhile, there's been a sharp rise in the volume and variety of freeze-dried foods available to the consumer—shrimp, dry soups, and stews. Packers are test-marketing freeze-dried meats, which offer tremendous savings in refrigeration equipment and transportation costs. The military, which has actively supported freeze-drying research, probably is the largest consumer of such products today. (End)



FREEZE-DRIED PRODUCTS are sponge-like yet retain foods' original shape and tenderness. Dried mushroom (left) readily reconstitutes to flavorful slices, as do chunks of chicken at right.





Target Stepped-Up Ad Efficiency

Unable — or unwilling — to offset mounting costs by higher prices, industry execs focus on getting more from marketing dollar. Aim now is harder working ad budgets, as GMA talks show

WAYS TO FATTEN PROFITS through more effective advertising were outlined by food company chiefs at the annual Grocery Mfrs. of America meeting last month. Sparking their suggestions were growing management preoccupation with rising media costs, bigger share of the operating budget that goes to merchandising each year, and the sharper competition in winning (and holding) of the consumer's attention.

A common theme sounded by most executives was the conviction that advertising must be coordinated with a company's overall market planning if it is to help profits grow.

More High Level Interest

Pet Milk Pres. Theodore R. Gamble urged top management to take a more active role in seeing to it that "advertising's communication value is considered at every stage from product inception to final sale." To carry this off, he continued, management should directly concern itself with how much is to be spent in this area, and in evaluations of the function's overall impact.

The number of dollars laid out for advertising, he stressed, "must be commensurate with the profits that can be realized. When introducing a new product, there is a need to build consumers quickly—with the recognition that the initial large investment will be returned with interest through continued consumer use of the product. For an established item, advertising must have a more immediate profit return."

In evaluating advertising's impact, the president said, management must consider all the other factors — product, price, distribution, selling efficiency, competition —that influence sales results. "We can realistically evaluate advertising's effectiveness," he said, "only when we know the true impact of all the other factors."

To W. A. Schroeder, executive vice president of Corn Products' Best Foods Div., "more creativity is the magic stimulant to stretching advertising dollars." Food makers can get the most out of an agency's creative functions, he said, by mapping out well-defined objectives, eliminating prejudices against particular copy themes or media, refraining from saddling the agency with time-consuming service tasks, and promoting smoother communications with their agencies.

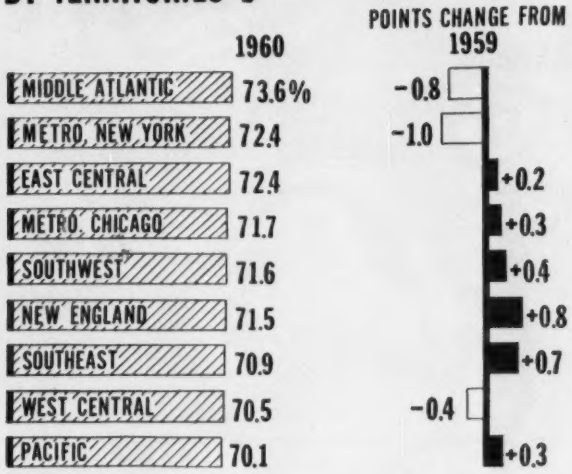
"Did You See It?"

Comments by participants in GMA's "president's panel" session indicated more presidents are taking a closer look at the ad dollar.

For example, John M. Fox, Minute Maid president, noted that

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

WHAT IS THE CONSUMER'S 1960 VOTE FOR MAJOR ADVERTISED BRANDS BY TERRITORIES ?



♦ Stand-Off In Battle of the Brands? ♦

MIXED QUOTA of good and bad news for food makers is contained in 3 charts shown here. By and large, manufacturers' brands held their own against private labels the past 2 yr., according to A. C. Nielsen Co. In '58, major advertised labels represented 70.8% of consumer purchases—the same as this year.

However, there's a grim side to this ostensibly cheering news. Nielsen's running tally-sheet on the brand ratio is now based on 73 commodity groups, compared to 40 used previously. Significantly, while the new index gives major brands 70.8% of the market in '58 and 71.0% in '59, the old index showed a comparatively higher scale—74.4% in '58 and 74.8% in '59. Thus, assuming that the larger base reflects the addition of newer, faster-moving product groups, it looks as if the private labels are making even stronger headway in that vital sector of consumer purchases.

Encouragingly, advertised brands showed more gains than losses this year, as the break-out by store type and territory shows. In chain stores, their 69.3% of purchases showed no change from a year ago, and in the larger independents they gained 0.8% to raise their share to 73.7%. Area-wise, they gained in 6 regions, lost in 3. They showed up best in the Middle Atlantic states, where they siphoned off 73.6% of consumer purchases.

as Profit-Squeeze Counter

his firm, "is getting a feel for effective advertising through annual audits. By ringing doorbells, and checking if people remember our ads and use our product, we get a close fix on how our objectives and programs are working.

A. C. Nielsen's J. O. Peckham, admitting that competitive moves and counter-moves throw the most elaborate ad spending yardstick out of whack, contended that "a product's share-of-market bears a fairly close relationship to its promotion investment."

"Advertising expenditures on a new brand," he cautioned, "must take the total advertising of the product field into account. If you shoot for 10% of the market, you must figure on ad support equivalent to at least 10% of the expenditures hitting that field."

Advertising will do a better job of ringing the bell at check-out counters, according to Pres. Watson Rogers, National Food Brookers Assn., when national campaigns are translated into local terms. He urged greater use of brokers in the planning stage since, as a result of their specialized market knowledge, they can advise on which media has the strongest pulling power, what type of point-of-purchase material is most productive, and the local peculiarities that must be considered in the merchandising program.

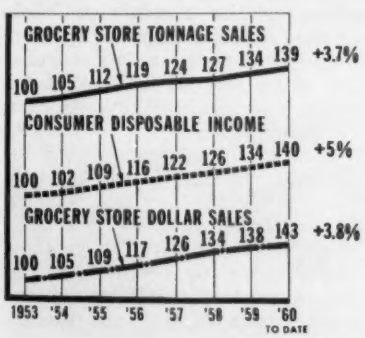
Still Going Up

In his annual "state of the industry" talk, Peckham pointed out that food store tonnage this year is running 3.7% ahead of '59 compared to the annual 5.6% increase chalked up between '53 and '59 (see chart below). Developments to date show these key trends, he noted:

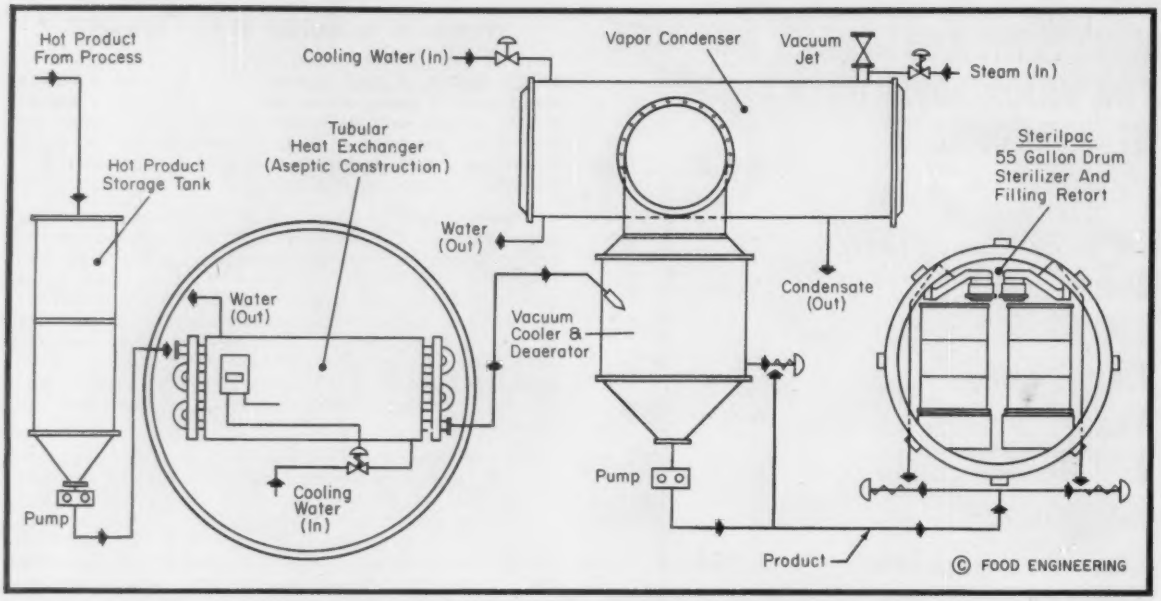
► **Larger-size stores continue to grab off bigger chunks of over-all sales.** Whereas 90,200 outlets siphoned off 70% of the business in '48, and 44,501 units just 2 yrs ago, only 39,500 stores will give you the same market share today. And for extra-fast movers (like coffee, cereals, baby foods, canned goods), 31,500 outlets do the trick.

► **Larger packages continue to grow in favor as the result of increased family size and uptrending income.** Based on a check of 13 brands, consumer purchases of extra-size containers rose from 23% of total tonnage in '56, to 28% in '58, and 31% in '60.

► **Convenience foods, and improved products, still set a hot pace.** For categories such as instant coffee, frozen orange juice, and cake mixes, gains this year show a 39% rise vs. 4% hike for overall food store sales. And among 18 products that were marketed nationally in '58, new and/or improved brands shot up 32% this year, and increased their share-of-market 18% (End)



◄ **SIMILARITY** between changes in consumer disposable income and food store sales over past 7 yr. are shown in this A. C. Nielsen chart. Thus, predicted income rise for '61 is good omen for food industry.



VOLATILE PRODUCTS from process pass through storage tank (left) and are pumped through aseptic pre-cooler before entering deaerator. Constant product supply allows continuous pumping into Sterilpac sterilizer and drum-filler (right).

Modified Unit Fills Drums Fast

Stepped-up continuous filling is provided with modernized Sterilpac system now adapted to volatile product handling

TWO MODIFICATIONS, sparked by customer problems, have been incorporated into the Sterilpac Drum Filling System by Thermovac, Inc., Stockton, Calif.

First valuable adjustment to this system (FE, Sept. '58) does away with the necessity of sterilizing the vacuum-flash cooler after each drum filling cycle.

Now, hot product is continuously pumped into the flash cooler, which is aseptically maintained under continuous vacuum. It also serves as a surge tank and always contains enough product to fill the four empty drums, eliminating the former batch-type operation.

With the exception of drum handling in and out of the retort, now semi-automatic, Sterilpac is an automated system. An operator, by push-button, starts the cycle after drums are positioned in the retort. In exact sequence, doors to retort are mechanically closed; drums are pre-sterilized and vacuum cooled; and product is filled (by weight) into drums. Containers are automatically sealed in this sterile atmosphere, and doors open mechanically. A ready supply of product speeds up cycle.

Second modification, requested by Flotill Products Corp., Stockton, is an aseptically constructed pre-cooler used when Sterilpac is employed for products containing added volatile constituents such as pizza sauce, catsup, etc. If flash-cooled in the vacuum cooler, volatile acids and flavors would be considerably reduced due to loss by evaporation.

Loss is completely avoided by pumping the hot, sterile product through the pre-sterilized, aseptic tubular cooler to reduce its flash point. Flowing to the vacuum-cooler prior to being filled in drums, product is effectively deaerated without flash and loss of flavor or moisture. It is filled in same sequential cycle.

Pre-cooler is constructed with double tube sheets to eliminate any possibility of contamination of product by leakage or cooling water. Tube sheets are further protected by steam shrouds to eliminate any air-borne contamination.

Flotill unit may be used for products with volatile constituents or for either fruit or tomato concentrates, merely by by-passing or using the aseptic cooler.

During pre-sterilization cycle before a run starts, pre-cooler is sterilized with high-pressure steam simultaneously with the rest of the Sterilpac system. During product operation, this system, including the pre-cooler and the vacuum flash-cooler (which now acts as a deaerator), is maintained sterile as long as properly processed product is pumped through the system. (FE Staff)

CIRCLE 103 ON READER SERVICE CARD ➔

Cherry-Burrell Knocks the Wind out of Peanut Butter

It's a peanut's lot to be crushed, cracked, crumpled and thrown at umpires. But after they're made into peanut butter, they're given the treatment of their lives to remove air from the product. Any air that's left affects flavor and short-fills jars. One Eastern processor needed a more effective method of deaerating peanut butter. He asked Cherry-Burrell to solve the problem.*

Cherry-Burrell engineers studied the situation and recommended a modified vacuum-pressure Round Processor. A special disperser injects a thin film of peanut butter into the processor, exposing trapped air to the vacuum. Specially designed agitators promote faster heat transfer and float trapped air to the surface. Unique surface breakers allow air to escape and to be removed by the vacuum. Now the manufacturer's peanut butter stays flavorful in the jar, and each jar is filled full every time.

Highly trained technicians will test your product without obligation in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing. Call or write Cherry-Burrell today.

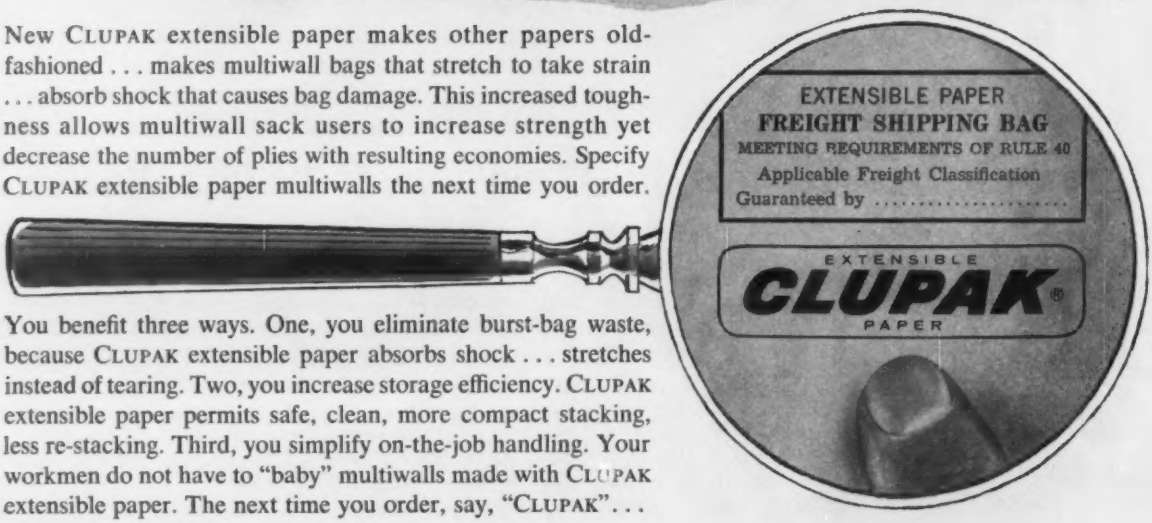
** Case history on request.*

EQUIPMENT FOR HOMOGENIZING, HEATING, COOLING, FLAVORIZING, STORING, SEPARATING, FREEZING, MIXING, PACKAGING AND CONVEYING. WRITE FOR YOUR FREE CATALOG.

CHERRY-BURRELL CORPORATION
CEDAR RAPIDS, IOWA

ELEMENTARY...IT'S A EXTENSIBLE CLUPAK® PAPER* MULTIWALL BAG ...THAT'S WHY IT DIDN'T BREAK!

New CLUPAK extensible paper makes other papers old-fashioned . . . makes multiwall bags that stretch to take strain . . . absorb shock that causes bag damage. This increased toughness allows multiwall sack users to increase strength yet decrease the number of plies with resulting economies. Specify CLUPAK extensible paper multiwalls the next time you order.



You benefit three ways. One, you eliminate burst-bag waste, because CLUPAK extensible paper absorbs shock . . . stretches instead of tearing. Two, you increase storage efficiency. CLUPAK extensible paper permits safe, clean, more compact stacking, less re-stacking. Third, you simplify on-the-job handling. Your workmen do not have to "baby" multiwalls made with CLUPAK extensible paper. The next time you order, say, "CLUPAK"... before you say paper.

*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

Colors Get Provisional Listings

FDA also terminates other color provisional listings. Extensions granted to more 'direct' and 'indirect' additives

IN REGULATIONS dated Oct. 12, 1960, the FDA gave rulings on color additives for food, drug, and cosmetic use. Only segments pertaining to food are mentioned here. In earlier rulings, extensions were granted until Mar. 6, 1961, to certain 'directs' and 'indirects' under specified limits and uses. Included as 'indirects' are substances migrating from adhesives used in food packaging.

For earlier listings, readers are referred to FE Jan., p. 81; Feb., p. 19; Mar., p. 89; Apr., p. 99; May, p. 77; June, p. 85; July, p. 85; Aug., p. 75; Sep., p. 117; and Oct., p. 115.

Provisional Regulations on Color Additives

New provisional listings . . .

(a) *Color additives provisionally listed for food, drug, and cosmetic use.*

FD&C Green No. 1
FD&C Green No. 2
FD&C Green No. 3
FD&C Yellow No. 5
FD&C Yellow No. 6
FD&C Red No. 1
FD&C Red No. 2
FD&C Red No. 3
FD&C Red No. 4
FD&C Blue No. 1
FD&C Blue No. 2
FD&C Violet No. 1
Lakes (FDC)

(d) *Color additive provisionally listed for use on mature oranges.*

Citrus Red No. 2

(e) *Color additives provisionally listed for food use on the basis of prior commercial sale but which have not been subject to certification.*

Annatto.
Beet juice.
Bixin and norbixin.
Caramel.
Carbon black (prepared by the "impingement" or "channel" process).
Carminic acid.
Carotene, natural and synthetic.
Charcoal (NF XI).
Chlorophyll copper complex and chlorophyllin copper complex.
Cochineal.
Iron oxides.
Titanium dioxide (limit of 0.4 percent as pigment in bakery and confectionery products).
Tumeric curcumin.
Ultramarine blue, 0.5 percent in salt for animal feed.

Provisionals termination . . .

(a) *Ext. D&C Yellow Nos. 9 and 10.* These colors cannot be produced with any assurance that they do not contain β-naphthylamine as an impurity. While it has been asserted that the two colors can be produced

'Directs' and 'Indirects' Receiving Stays

DIRECT ADDITIVES	LIMITS	SPECIFIED USES OR RESTRICTIONS
Acetone	30 ppm.	As a residual solvent in manufacture of spice oleoresins.
Butoxy polyethylene polypropylene glycol, 2500–2600 molecular weight.	2 ppm. in extraction liquor.	As a defoaming agent in manufacture of beet sugar.
Disodium calcium ethylenediamine tetraacetate dihydrate.	35 ppm.	As a sequestrant in carbonated beverages.
	110 ppm.	As a sequestrant in nonstandardized dressings.
Disodium dihydrogen ethylenediamine tetraacetate dihydrate.	100 ppm.	Do.
	200 ppm.	As a sequestrant in vinegar.
Disodium ethylenediamine tetraacetate	do.	As a sequestrant in trace mineral-fortified animal feeds.
Fucellaria fastigiata, aqueous extract of		As a gum used in foods.
Hexane	25 ppm.	As a residual solvent in manufacture of spice oleoresins.
Hydrocarbon oil (deodorized), kerosene aliphatic type.	30 ppm. in extraction liquor.	As a defoaming agent in manufacture of beet sugar.
Isopropanol	50 ppm.	As a residual solvent in manufacture of spice oleoresins.
Methanol	do.	
Methylene chloride	30 ppm.	
N-Monomethylamide of *O,O*-dimethyldithiophosphoryl-acetic acid.	1.0 ppm.	As a residue in processed olives and olive oil.
Morpholine	3 ppm.	As a constituent of coating on fruits and vegetables.
Polyethylene glycol 400 tallow diester	3 ppm. in extraction liquor.	As a defoaming agent in manufacture of beet sugar.
Polyethylene glycol 800 ester of cottonseed oil fatty acids.	500 ppm.	As a solubilizing agent in pickles.
Polyethylene glycol ester of mixed fatty acids from tall oil (abietic, oleic, linolenic), average molecular weight 1050.	2 ppm in extraction liquor.	As a defoaming agent in manufacture of beet sugar.
Polypropylene glycol, average molecular weight 2000.		
Sodium nitrate or a combination of sodium nitrate and sodium nitrite.	200 ppm., as sodium nitrite.	In smoked, cured fish as a preservative.
Do.		In meat-curing salt under directions for use that will result in residues of not more than 200 parts per million, calculated as sodium nitrite, in home-cured meat.
Soybean and cottonseed fatty acids (palmitic, stearic, oleic, linoleic, linolenic, myristic).	25 ppm.	As a defoaming agent in manufacture of beet sugar.
Trichloroethylene	30 ppm.	As a residual solvent in manufacture of spice oleoresins.

The following **direct** additives have been specified for use as dietary supplements with indicated limits:

p-Aminobenzoic acid	30 mgm./da.	Cobalt (from cobalt gluconate, cobalt sulfate, cobalt chloride, cobalt carbonate)	1.0 mgm. Co/da.
Betaine hydrochloride	100 mgm./da.	Iron (from ferrous fumarate)	115 mgm. Fe/da.
Citrus bioflavinoids (including hesperidin)	60 mgm./da.	Iodine (from kelp, potassium iodide, potassium iodate)	0.7 mgm. I/da.
Iron chlorophyllin	2.5 mgm./da.	Nickel (from nickel sulfate)	1.0 mgm. Ni/da.
Liver-stomach concentrate (with intrinsic factor complex)	125 mgm./da.	Boron (from sodium borate, boric acid)	0.03 mgm. B/da.
DL-Methionine	200 mgm./da.	Fluorine (from sodium fluoride, potassium fluoride, calcium fluoride)	0.5 mgm. F/da.
Rutin	50 mgm./da.	Molybdenum (from sodium molybdate, molybdenum trioxide, molybdenum sesquioxide, ammonium molybdate)	2.0 mgm. Mo/da.
Menadione	1 mgm./da.		
Menadione sodium bisulfite	1 mgm. menadione/da.		
Copper (from copper sulfate, copper chloride cupric oxide)	10 mgm. Cu/da.		
Titanium dioxide	0.5 percent	As a pigment in capsules and tablets.	

As **indirect** additives, the following items have been specified:

INDIRECT ADDITIVES	LIMITS	SPECIFIED USES OR RESTRICTIONS
Gum rosin		In cotton bagging for dry food packaging.
Nylon resin (polyhexamethylene adipamide), average molecular weight 18,000.		In milk-processing equipment.
Nylon resin (polyhexamethylene sebacamide, average molecular weight 18,000).		Do.
Polyvinyl alcohol and polyvinyl alcohol with melamine formaldehyde resin.	Not to exceed 1.2 parts per million in milk.	From use as binders in fiber milk-filter discs.
Polyethylene glycol 200 dilaurate		As a constituent of defoaming agent used in manufacture of food-packaging materials.
Sodium alkyl (tertiary butyl; tertiary amyl; isopropyl and ethyl; hexyl, heptyl and octyl) benzene sulfonates.		In coating and adhesives used in food packaging.
Sodium *O*-phenyl phenate		As a constituent of defoaming agent used in manufacture of food-packaging materials.

without the impurity named, no method of analysis has been suggested to establish the fact. β-Naphthylamine is a known carcinogen; therefore, there is no scientific evidence that will support a safe tolerance for these colors in products to be used in contact with the skin. The Commissioner of Food and Drugs, having concluded that such action is necessary to protect the public health, hereby terminates the provisional listing of Ext. D&C Yellow No. 9 and Ext. D&C Yellow No. 10.

(b) (1) *D&C Red Nos. 8, 9, 10, 19, 33, 37; D&C Yellow No. 7; D&C Orange Nos. 5 and 17.* Subacute studies have established that these colors are toxic substances, unsafe for unrestricted use in drugs and cosmetics.

(2) *D&C Red Nos. 11, 12, and 18.* These colors are chemically related to D&C Red No. 10, being the calcium, barium, and strontium salts of the same dye, and are chemically indistinguishable from D&C Red No. 10 in the analysis of a product in which such colors have been used. They therefore must be subject to the same restrictions imposed on D&C Red No. 10.

(3) *D&C Yellow No. 8.* This color is chemically and pharmacologically related to D&C Yellow No. 7, and therefore must be subject to any restriction imposed on that color.

Migrating Substances from Adhesives Listed

Extensions have been granted to certain items as **indirect** additives to food: *Substances migrating from adhesives used in food packaging.*

N-Acetylethanolamine; Aminomethylpropanol; Ammonium borate; Ammonium sulfamate; 2,5-di-*tert*-Amylhydroquinone; Antimony oxide.

Balata rubber; Barium peroxide; *p*-Benzyloxyphenol; Bisphenol A (polybutylated) mixture; di-Butoxy ethyl phthalate; Butoxy polypropylene glycol; di-Butylmaleate; Butyldecylphthalate; 4,4-thiobis-6-*tert*-Butyl-*m*-cresol; 2,6-di-*tert*-Butyl-4-methylphenol; Butyloctyl phthalate; Butylphthalyl butylglycolate; Butyl rubber dispersion; Butyl titanate (polymerized).

Calcium nitrate; Chlorinated rubber (natural rubber containing approximately 67% chlorine); tri-β-Chloroethyl phosphate; Cresyldiphenylphosphate; Cyclohexanone and formaldehyde condensate; *N*-Cyclohexyl *p*-toluene sulfonamide.

Diethyleneglycol hydrogenated tallowate, monoester; Dimethyl formanide; Dinonylphenol; Diphenyl and terphenyl, hydrogenated.

Ethylene dichloride; di-(2-Ethylhexoate); di-2-Ethylhexyl adipate; 2-Ethylhexyldiphenylphosphate; Ethyl-*p*-hydroxybenzoate.

Ferric chloride; Fish glue; Formaldehyde-reacted starch; Formaldehyde *o*- and *p*-toluene sulfonamide; Furfural; Furfuryl alcohol.

Glyceryl borate modified (glycol boriborate resin); Glyceryl monohydroxy stearate; Glyceryl monohydroxytallowate. Hydroquinone monobenzyl ether.

di-Isodecyl adipate; di-Isobutyl phthalate; di-Isodecyl phthalate; 4,4'-isopropylidenediphenol (polybutylated) mixture. Japan wax.

Lauryl pyridinium salt of 5-chloro-2-mercaptobenzothiazole; Limed wood resin.

Magnesium oxide; Manganese acetate; Melamine-formaldehyde; Methylethyl ketone and formaldehyde condensate; 1-Methyl-2-hydroxy-4-isopropyl benzene; Methyl salicylate; Monochlorobenzene; Myristochromic chloride.

di-β-Naphthyl-*p*-phenylenediamine; 2-Nitropropane; Nonyl phenolethylene oxide condensates (with 40 mols ethylene oxide).

di-*n*-Octyldecyl adipate; Octyldecyl phthalate; Octylphenol; Octyphenoxyethanols.

Paraffin wax (70% chlorinated); Petroleum hydrocarbon resins manufactured by copolymerization of dienes and olefins from low boiling cracked petroleum stocks; Phenyl-β-naphthylamine (free of β-naphthylamine); *o*-Phenylphenol; β-Pinene, polymerized; β-Pinene, resin; Pine oil; Polyethylene glycol 400 stearate; Polyethylene glycol 600 dioleate; Polyethylene glycol 600 oleate; Polymeric esters of polyhydric alcohols and polycarboxylic acids prepared from glycerin and phthalic anhydride and modified with vegetable oils (soybean, linseed, castor, coconut), benzoic acid, rosin, styrene, vinyl toluene; Polyoxyethylated nonyl phenol; polypropylene glycol 1200; Polyvinyl ethyl ether; Polyvinyl pyrrolidone; Potassium permanganate; Potassium sodium tartrate; Potassium tripolyphosphate; Propylene glycol monolaurate.

Quaternary ammonium chloride (hexadecyl, octadecyl, octadecenyl derivative).

Salicylic acid; Sodium chlorite; Sodium *a*-naphthalene sulfonate; Sodium chromate; Sodium heptadecyl sulfate; Sodium hypochlorite; Sodium mercaptobenzol; Sodium pentachlorophenate; Sodium polystyrene sulfonate; Stearic acid; Stearyl dimethyl-benzyl ammonium chloride; Styrene-butadiene rubber; Styrene with maleic anhydride copolymers; Sulfated rice bran oil; Sulphur.

Tall oil; Tallow, sulfated; Tetrahydro furfuryl alcohol; *o*- and *p*-Toluene sulfonamide; 1,1,1-Trichloroethane; Triethyleneglycol di-(2-ethyl) hexoate; Triethylphosphate; Triphenylphosphate; Trisodium ethylenediaminetetraacetate monohydrate.

Zein; Zinc acetate; Zinc ammonium chloride; Zinc chloride; Zinc dibutyldithiocarbamate.

SPLIT-EYELET CONNECTORS

For faster, easier connection of spray nozzles, branch lines and equipment to piping and tubing carrying liquids, gases or air up to 250 psi. Write for Bulletin 93.

FOR BETTER PERFORMANCE

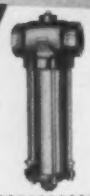
SPRAY NOZZLE ACCESSORIES

ADJUSTABLE JOINTS

For easy, exact adjustment of spray direction. Made in size for ¼" to 2½" pipe in brass, steel and stainless steel. Write for Bulletin 97.

...EASIER INSTALLATION

FOR COMPLETE SPRAY NOZZLE INFORMATION WRITE FOR CATALOG 24



LINE STRAINERS

Special non-collapsing screen design for pressures up to 125 psi, for all pipe lines from ¼" to 6" size. Also high pressure strainers for up to 5,000 psi service. Write for Bulletin 94.

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WASHEX— Automatic Toilet Seat

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CIRCLE 151 ON READER SERVICE CARD

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Sauces – fruit jells – aspics –
relishes – desserts – low-calorie jams

Here's a new field – with new profits – for you! With EXCHANGE LOW METHOXYL PECTIN, you can now make a *full line* of gelled foods of any degree of sweetness—even sugar free and low in calories for diabetics and dedicated weight-watchers!

L.M. Pectin is the only pectin that forms a true gel without sugar. The gels keep their shape and firmness at room temperature – yet are tender, elastic, sparklingly brilliant and perfect for flavor. GET FULL INFORMATION on this exclusive development of Sunkist citrus research – including technical data and formulas. Call your Sunkist man or mail the coupon today.

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Gentlemen: Please send data on use of Exchange Low Methoxyl Pectin in ( ) low-calorie jams ( ) aspics ( ) fruit jells ( ) relishes ( ) desserts ( ) sauces ( ) other.

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Lawry's new "dress" for its tasty salad dressings is easy to spot on the supermarket shelf, goes proudly right to the table.
All five members of the family stand together in just 8½ inches of shelf space.

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Men & Companies

M.I.T. Expands Food Tech . . . President Julius A. Stratton of Massachusetts Institute of Technology announced expansion of teaching and research in the field of foodstuffs and nutrition. In conjunction with expansion in this area, Dr. Nevin Stewart Scrimshaw has been appointed to head the newly created Department of Nutrition, Food Science and Technology. The enlarged department will be formed around the existing Food Technology Department.

Dr. Scrimshaw is presently director of the Institute of Nutrition of Central America and Panama (INCAP) and regional advisor on nutrition of the Pan American Health Organization, Regional Office for the Americas of the World Health Organization. He will assume his duties at M.I.T. in August '61. Executive officer for the new department will be Dr. Samuel A. Goldblith.

Dr. Nevin S. Scrimshaw

Hans J. Wolflisberg

Paul S. Willis

New A.I.D.A. Heads . . . Elected to the presidential post of the International Assn. of Food Distribution is Hans J. Wolflisberg, president of the Nestle Co., Inc. Paul S. Willis, president of the Grocery Manufacturers of America, Inc., is new vice-chairman of the Fifth International Food Congress, scheduled for N.Y.C. in '62 under the sponsorship of A.I.D.A.

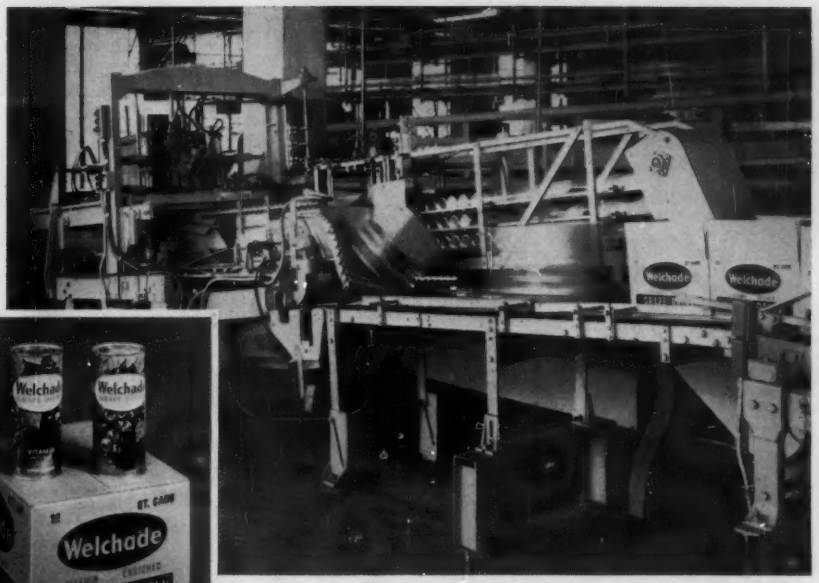
Mr. Wolflisberg joined Nestle in London in 1927 and has since served the firm in Switzerland, England, the Philippines, Malaya and other Oriental countries. He has been engaged in several phases of the firm's operations including sales and advertising.

Mr. Willis is former v.-p. and general manager of Comet Rice Co. While serving in that capacity, he was in 1932 elected president of GMA on an honorary basis for a one-year term and re-elected the following year. Before the end of his second term, Mr. Willis was asked to serve as GMA's president on a full time basis.

Edward M. Scheu

Lipton Names V.-P. . . . Appointed Development v.-p. at Thomas J. Lipton is Edward M. Scheu, former president of the Diamond Match Co., Div. of Diamond National Corp. In his new post Mr. Scheu will head up the technical research and market research departments and will be responsible for new product development and new product lines, including acquisitions of product lines and companies. He will report directly to W. Gardner Barker, Lipton president and

Welch's Plant Productivity Increased 100% with C&K Packing Line



Knocked down cases are formed (left) and then automatically positioned at can packer funnel. Packer (center) loads 12 qt. cans into case and automatically discharges on conveyor to sealing machine. Because of the high capacity of these machines, Welchade production could be stepped up without equipment change.

Welch Finds C&K Packing Equipment Superior with Installation Easy to Maintain

"Requires only routine preventive maintenance," says Plant Manager Bernard C. Robbins.

Increased market demand for its 32-oz. canned Welchade made it necessary for the Welch Grape Juice Company to streamline operations on this product. The switch from hand to automatic packing was made in the plant at North East, Pa., late in 1959 by installing a Crompton & Knowles Model CK/SMF-2 Standard Can Packer and a Model CKCO Case-Opener-Former-Positioner.

Spectacular Results Achieved

This C&K equipment increased packing production from 180 to 240-cans-per-minute; an increase of 33%. Welchade production could be stepped up even further without equipment change. Overall results have increased plant productivity 100%. It is interesting to note that Welch recently installed a Model CK/SMF-2 Standard Can Packer at its plant in Kennewick, Wash.

Bernard C. Robbins, plant manager, characterized the Crompton & Knowles equipment as "superior" and reported that only "routine preventive maintenance" is required.

Welch's experience is one of many recent instances in which new speed and economy followed a contact with Crompton & Knowles Packaging Corp. Whether your need is to meet a simple packing or wrapping operation, or for a completely integrated, multiple-operation packaging project, we offer you the services of a highly-specialized engineering organization geared to find the most efficient answer. C&K makes high-speed automatic lines for packing, case-forming, sealing and gluing, can palletizing and depalletizing, and Wrap-King lines for wrapping simple or complex shapes.

We invite you to find out how C&K can serve you. For full details, including leasing arrangements, write Crompton & Knowles Packaging Corp., Holyoke, Mass., U.S.A.

CROMPTON & KNOWLES
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National Sales and Service Offices: NEW YORK CHICAGO • LOS ANGELES • ATLANTA • DALLAS CLEVELAND • BERKELEY, CALIF • SEATTLE WINTERHAVEN, FLA. • TORONTO • MONTREAL

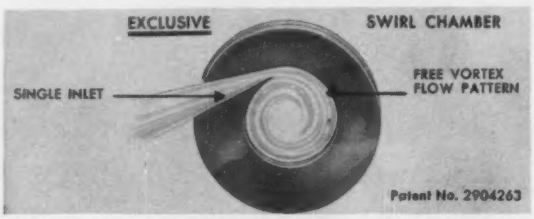
CIRCLE 109 ON READER SERVICE CARD

DELAVAN'S

CARBIDE SPRAY DRYING NOZZLE

with new advanced design

LONGER LIFE. Tests have proved, SDX Nozzles last longer than other nozzles in spray drying highly abrasive materials. Orifice disc and back plate are made of tungsten carbide.



Special patented swirl chamber is made of hardened stainless steel. The chamber's single inlet and spiral configuration produces a natural, free vortex flow pattern. This pattern minimizes friction, adds to the nozzle's long life, and improves its spray characteristics.

BETTER ATOMIZATION. The SDX Nozzle produces a uniform hollow cone spray pattern with exceptionally uniform particle size distribution. It has the added advantage of offering excellent atomization at lower operating pressures.

CERTIFIED PERFORMANCE. The flow rates on Delavan SDX Nozzles are certified to be within ±5% of rated capacity, tested on water at 1000 psi. Spray angles are certified to be within ±5° of rated spray angle. This certification is your assurance that these Delavan nozzles will perform as rated.

WIDE CHOICE OF CAPACITIES AND SPRAY ANGLES Both nozzles are available in a full range of flow rates, each rate furnished as standard in several spray angles. Matching the flow rate and spray angle in your dryer often means greater efficiency and a better end product.

For complete information on the Delavan SDX and other spray nozzles write for Catalog SD-1 and SD-2.

"World's largest manufacturer of nozzles"

DELAVAN Manufacturing Company
WEST DES MOINES, IOWA

Men & Companies

newly elected president of the Tea Assn. of the U.S.A., Inc.

Mr. Scheu came to Diamond Match in '57 as assistant to the vice - president and general manager, working primarily in sales and manufacturing. In '58 he was named president of Diamond Match. Prior to this affiliation, he held several executive positions at Scott Paper Co.

Personnel

Albert F. Watters, General Foods v.-p., is new v.-p. in charge of AMA's Personnel Div. **W. H. Enzie** moves up to director of corporate packaging development at GF.

Eugene Holman, former board chairman at Standard Oil of N. J., is now a director of Borden Co.

Daniel J. Bloch takes over as production v.-p. at Minute Maid International.

John P. Hoban, Jr., takes over as v.-p. and general sales manager of Bond Pickle Co.

C. W. Rockabrand takes over as national sales manager for Minute Maid's Frozen Orange Juice Bar.

Jack Rosenthal has joined Chock Full 'O Nuts Corp. as v.-p. and director of advertising and marketing.

George C. P. Olsson begins third term as president of Ocean Spray Cranberries.

Ralph M. Watts succeeds **Ralph E. Kahl** as marketing v.-p. at Borden Foods.

A. E. Beeby is now v.-p. of Salada - Sherriff - Horsey, Inc., and general manager of Salada-Junket Div.

Dr. Bernard S. Schweigert has been named head of new department of food science at Michigan State U.

J. A. Willman has assumed management of Royal Crown Cola's new canning operations in Auburndale, Fla.

Eugene E. Wooley, general manager of Feed Division; **William B. Cash,** marketing director, Flour & Mix Products, Grocery Products Div.; and **Lowry H. Crites,** marketing director, Cereals, Pet Foods, Refrigerated, and Household Products, Grocery Products Div., have been named v.-p.s at General Mills.

Ervin L. Peterson, assistant secretary, of USDA, assumes executive directorship of Milk Industry Foundation.

Paul Imes is now technical director at Carey Salt Co.

Leo J. Riconda moves up to executive engineer at General Mills. **D. E. Schaetzel** replaces him as senior staff engineer.

Herbert G. Reid is new controller at International Flavors & Fragrances.

Ogden A. Geilfuss, Southern Bakeries Co. president, takes over directorship of Commercial Bankers Discount Corp.

Charles V. Simpson is new president of American Soybean Assn.

Norman Kempf, manufacturing consultant for Walter Baker Chocolate, is chairman of Research Advisory Committee of National Confectioners Assn.

Harold C. Cushenbery moves up to sales director and **Edward G. Ball** takes over as director of sales promotion at Miller Brewing Co.

Walter E. Kelly takes over assistant v.-p. post at Fleischmann.

Robert E. Picken, Peerless Confection Co. president, is now chairman of Sanitation Committee of National Confectioners Assn.

Theodore O. Kluge, executive v.-p. of Sunsweet Growers Inc., is new board member at Duffy-Mott Co.

Theodore W. Prescott becomes marketing v.-p. at Charles E. Hires Co.

L. J. Sauers has been named executive v.-p. and general manager, and **J. B. Short-**

DOW | announcing VERSENE CA

CONTROL SPOILAGE LOSSES WITH NEW DOW CHELATING AGENT

A NEW APPROACH to problems caused by trace metal ions in food is now available. Versene® CA chelating agent is calcium disodium EDTA (calcium disodium ethylenediaminetetraacetate dihydrate)—a product developed specifically for the food industry. It chemically inactivates troublesome metal ions such as iron, copper and nickel. Such ions, unless controlled, can cause formation of undesirable precipitates and complexes and catalyze oxidative degradation.

UNWANTED PRECIPITATES AND COMPLEXES are widely encountered in food products. Insoluble, needle-like struvite crystals frequently form in canned seafood, decreasing customer acceptance. Complexes of heavy metals appear to be a cause of "gushing" or "wildness" in beer and cloudiness and sedimentation in wine. Versene CA chelating agent solves both these problems. In addition, it may be utilized to eliminate the undesirable blackening caused in cauliflower, asparagus, and potatoes by iron complexes.

RETARDATION OF OXIDATION with Versene CA is an excellent method for stabilizing flavors and odors and thus extending the shelf life of food products based on fats and oils. Inactivation of metal ions not only eliminates the catalytic effect of the ions on the oxidative process, but also enhances the effect of anti-oxidants such as ascorbic acid. Versene CA has been shown to eliminate the white ring which commonly forms on the surface of French dressing during storage. Retardation of oxidation extends the shelf life of mayonnaise, salad dressing, margarine, nutmeats, and similar products.

FDA REGULATIONS on the use of Versene CA in sandwich spreads, malt beverages, and in non-standardized sauces and dressings were published in the August 4, 1960 issue of the FEDERAL REGISTER. Further regulations under the Federal Food, Drug and Cosmetic Act are expected to permit the use of Versene CA in other food products.

FOR FURTHER INFORMATION and samples write Technical Service and Development, THE DOW CHEMICAL COMPANY, Midland, Michigan, Department 605KE11.

See "The Dow Hour of Great Mysteries" on NBC-TV.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

DAIRYMEN'S ASSOCIATION LTD., HONOLULU . . .

Enlarged ice cream manufacturing plant locates

KING UNITS

on roof for increased hardening room capacity

Part of plant addition. Distribution from two roof-top units makes fast hardening possible in clean, frost-free rooms.

During the recent expansion of this fine ice cream manufacturing plant in our newest state, Dairymen's Association, Ltd., replaced a troublesome system with a trouble-free King Sharp Freeze installation.

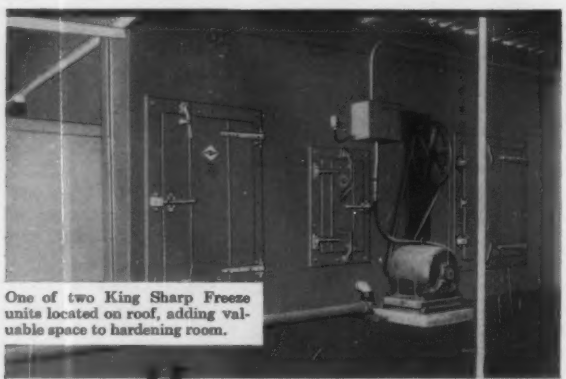
Improvements brought about by the King system are:

1 Four floor type blower units, previously occupying valuable space in the hardening room, have been replaced by two King Sharp Freeze units located on the roof above the room.

2 A 25° to 30°F. room temperature rise during defrosting of the old units has been eliminated with the King Sharp Freeze installation, improving the product texture immeasurably. This is possible because the King units are independent of the room during defrosting.

3 Frost problems in the hardening room, due to the very high humidity in Hawaii, have been alleviated completely.

Why not find out how King engineers can reduce sharp freezing and storage costs, help you maintain high quality products and improve your handling operation? More than 50 years' experience on installations in over 60% of the nation's largest plants, is at your service.



One of two King Sharp Freeze units located on roof, adding valuable space to hardening room.

Write for free technical bulletin

SHARP FREEZE SYSTEMS

King COMPANY OF OWATONNA

905 N. Cedar St., Owatonna, Minn.

Men & Companies

lidge sales v.-p. of American Home Products Corp.

Norman D. Jones is new labor relations director at Campbell Soup Co.

Industry

Gulf American Corp. has been formed to handle sales, research, and product development for all banana products manufactured by Pan-Am Foods, Inc., Tex.; Gulf Southern Corp., Fla.; and Standard Fruit & Steamship Co., La.

Grocery Manufacturers of America established new Advertising Committee to act as counsel with GMA president Paul S. Willis on advertising matters.

General Foods' Domestic Military Sales Dept. now extends services to West Coast.

Hawaiian Pineapple Co. stockholders approved changing firm's name to Dole Corp., thus alleviating long existing confusion between the two names.

Sunshine Biscuits has acquired **Fiesta Foods Corp.**, Phoenix, and will operate it as a wholly owned subsidiary.

General Foods Corp. announced plans to construct a district sales and distribution center in Anaheim, Calif.

North Pacific Canners & Packers, Inc., Portland, Ore., has started construction of a new frozen and canned research and development plant in Portland.

National Research & Development Corp. has acquired **Peter Pan Baking Co.**, according to joint announcement by Dr. Carsbie C. Adams and Rea Todd, respective company presidents. Peter Pan becomes Nutritional Products Div. of NRDC.

Dr. Pepper Co. has set up franchises at **Clicquot Bottling Co.**, Cairo, N. Y., and at **Hersh Beverage Co.**, Schenectady, N. Y.

Rose Hill Poultry Corp., Rose Hill, N. C., has opened a $350,000 poultry processing plant in Duplin County, N. C.

Associated Industries

Pillsbury Co. announces completion of negotiations for purchase of assets of The Tidy House Products Co., Shenandoah, Ia., makers of household cleaning products.

Fred D. Pfening Co. chief executive T. F. Ronson is new president of Bakery Equipment Manufacturers Assn.

Miles Chemical Co. plans construction of a $2 million citric acid plant in Haifa, Israel, with completion set for '61.

Dodge Mfg. Co. of Mishawaka, Ind., announces formation of a wholly-owned subsidiary, **DM International**, headquartered in Zug, Switz.

Griffith Laboratories, Inc. has purchased **Relco Specialties, Inc.**, manufacturer of bakery specialties.

Du Pont Co.'s Film Dept. has opened a fully stocked warehouse in Dallas, Tex., for "faster and more efficient service."

ERECTED AT A COST of over $1 million, this new Chicago-based Anheuser-Busch building houses office and warehouse facilities for the company's beer branch, bakery products operations, and corn products branch. The new structure is designed for future expansion.

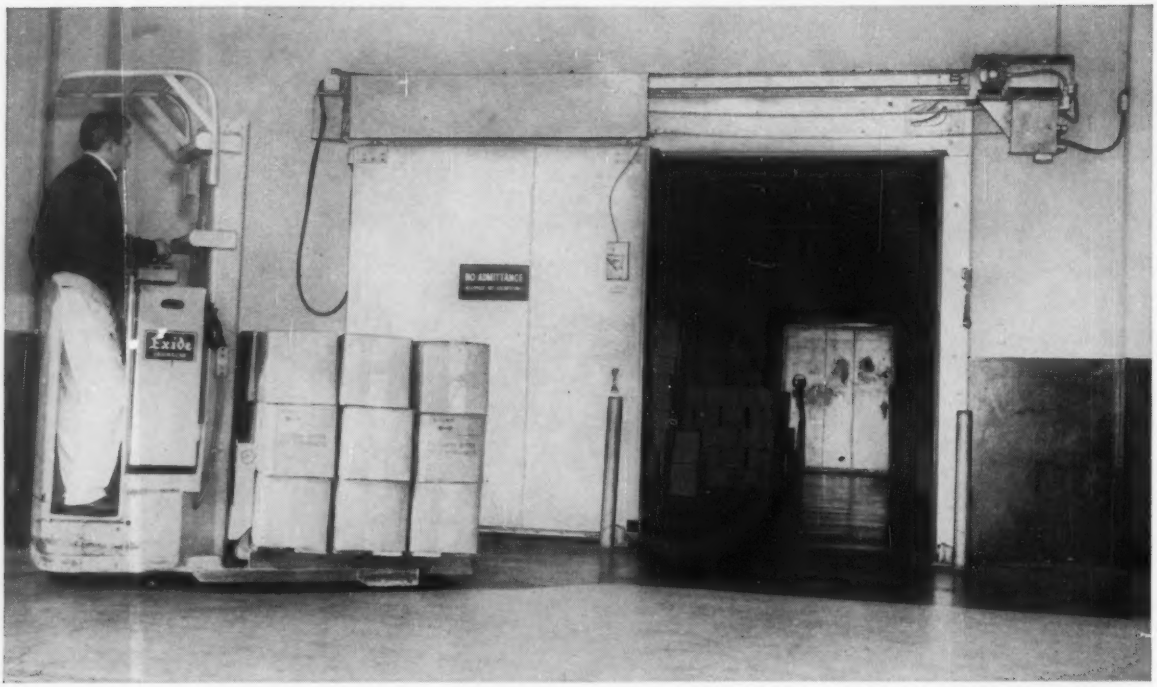
IMITATION VANILLA BEAN FLAVOR BY FIRMENICH

Vanilla Bean Flavor by Firmenich stems from the vanilla bean. By original research, its components and desirable characteristics have been isolated, identified, and synthesized. By patient and painstaking laboratory techniques, they have been reconstructed for you in a precise and potent flavor material with all the aromatic qualities of the original. Vanilla Bean Flavor by Firmenich comes to you as an economical replacement of pure vanilla extract, of pure vanillin, or to use in combination in the manufacture of all products that you flavor with this most popular of flavors. Contains no coumarin.

FIRMENICH & CIE.
SUCCESSEURS DE
CHUIT, NAEF & CIE.
GENEVE SUISSE

FIRMENICH INCORPORATED

250 WEST 18TH STREET, NEW YORK 11
FIRMENICH OF CANADA, LIMITED,
348 WALLACE AVENUE, TORONTO
CHICAGO OFFICE: 612 NORTH MICHIGAN AVENUE
LOS ANGELES, 1756 MALCOLM AVENUE
GENEVA PARIS LONDON



TIME AND LABOR SAVER. Electroglide remote pull switch allows operator to open door without leaving truck.

Jamison *Electroglide*® Power Doors

stand up under continuous, high volume traffic

RAPID OPENING AND CLOSING. Fast operation speeds traffic, saves refrigeration. Single leaf and bi-parting doors available to meet varying wall conditions.

• For ten hours every day, foot and truck traffic speeds through three Jamison Electroglide power-operated cold storage doors at the Wilsey, Bennett Co., Los Angeles, Calif. High volume, heavy traffic operations such as this demonstrate conclusively that Electroglide doors keep traffic moving profitably—and stand up under the most rugged duty.

Electroglide reduces operating costs through special features that assure rapid, easy opening, smoother operation, maximum safety, positive sealing and simple, low cost installation.

For complete performance and specification data write for Electroglide Bulletin to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON
COLD STORAGE DOORS

FE SERVICE CENTER

Catalogs ..... p. 135
Books ..... p. 138
Patents ..... p. 140
Classified ..... p. 142
Advertisers Index ..... p. 146
Reader Service ..... Back of Book

NEW EQUIPMENT & SUPPLIES

Bulk Handlers Now Made In Lightweight Magnesium

To induce greater use of bulk handling in over-the-road shipping, magnesium containers (Tote Bins) are now offered at the same price as maker's standard aluminum units. Some 40% lighter, they permit delivery of greater payloads while remaining within highway load limits.

Sizes range 42-110 cu. ft. for dry product handling; 300 and 400 gal. for handling of liquids. And other special sizes can be fabricated.—*Tote System, Inc., Beatrice, Neb.*

Circle 251 on Reader Service Card

CRYSTALLINE CELLULOSE (left) is free-flowing material that produces smooth water gels of varying consistency.

OIL-ABSORBENT PROPERTY of odorless, tasteless cellulose converts oily products, such as cheese and peanut butter, into dry free-flowing powders at right.

Cellulosic Product Has Many Food Uses

Processors are taking a sharp look at a new crystalline cellulose said to impart critical functional properties to a wide range of convenience foods and low-calorie products. Typical qualities include gel stability, bulk, capacity, texture, and palatability.

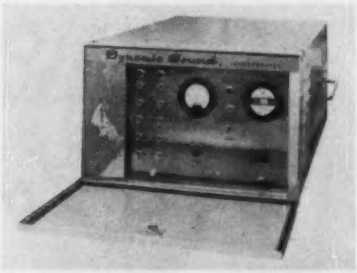
As a non-caloric water gel, the odorless and tasteless product (Avicel) offers the creamy texture and stability required for superior dressings, puddings, custards, and toppings. In dry form, the cellulose is an absorbent that converts oil-based foods such as cheese and peanut butter, and syrups (molasses and honey) into free-flowing form.

FDA reportedly considers the product 'generally recognized as safe,' and as such it is not a food additive.

Preparing the gel requires wet-attrition at 35% solids in a Hobart-type mixer for about 25 min. Then the mix may be diluted with water to desired consistency. Oily and syrupy foods are also processed in a mixer, the cellulose being added slowly, until the desired dry mix is obtained.

Limited supplies of product are now available for laboratory evaluation.—*American Viscose Corp., Corporate Market Development Dept., Marcus Hook, Pa.*

Circle 253 on Reader Service Card



Ultrasonics Routs Rodents

This high-frequency sound device reportedly clears buildings of rats within 72 hr.

Sound pressure particularly disturbs rodents and causes them to flee beyond instrument's broadcasting range. During the rats' flight, they become highly vulnerable to other traditional extermination devices.

Vibrations are heard only by rats and mice, being far above the capacity of the human ear. Furthermore, rats cannot build up an immunity to the waves, which are erratic in range. Sound pattern is not duplicated until long after the rats' endurance time limit.

A unit (Dynamic Sound) measuring 20x31½x12 in. serves up to 120,000 sq. ft. of space with aid of transducers or speakers as necessary. A time clock mechanism permits scheduled broadcasting, particularly effective at night when rodents are most active and destructive.—*Dynamic Sound, Inc., 15235 Lorain Ave., Cleveland.*

Circle 252 on Reader Service Card

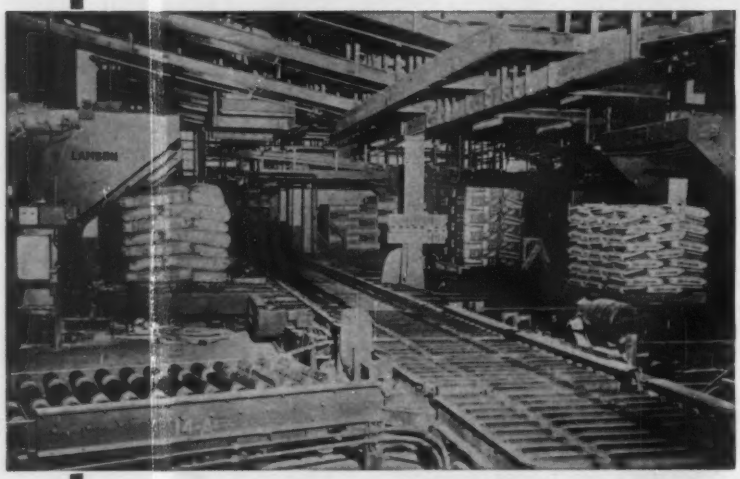
'61 Trucks Improved

Evolutionary refinements in suspension system, moderate frontal styling changes, and normal year-to-year improvements in chassis and cab mark the 1961 Chevrolet truck line.

A suspension using independent front springing with torsion bars

MECHANIZE... PROFIT-WISE!

WITH LAMSON ENGINEERED CONVEYOR SYSTEMS



Automatic Palletization — the hub of a LAMSON engineered conveyor system linking production lines to warehouse.

You cut production time and the unnecessary handling of materials to the bone with the help of LAMSON engineers. They are specialists in developing materials handling systems that truly increase the capacity of your present buildings and dramatically increase the productivity of your present equipment.

There are more LAMSON custom engineered conveyor systems in successful operation today than any other kind. They are being serviced throughout their life by the same LAMSON field offices that initially analyzed the problem, proposed the solution and supervised the installation.

As a result of this complete, professional service you will find many of the finest names in industry among LAMSON installations. During the past 75 years LAMSON has been active in almost every field, yours included, and perhaps even in divisions of your own firm. LAMSON can cut costs; speed production; increase your profits.

If you have a materials handling problem, write LAMSON today for our conveyor catalog and the name of your nearest LAMSON Field Engineer. Or, simply clip this advertisement to your letterhead and mail to:

LAMSON

PIONEERS *the Conquest* OF INNER SPACE

LAMSON CORPORATION

1107 Lamson Street, Syracuse 1, New York

PLANTS IN SYRACUSE AND SAN FRANCISCO • OFFICES IN ALL PRINCIPAL CITIES

Manufacturers of Airtube® (Pneumatic Tube Systems) • Integrated Conveying Systems • Pallet Loaders • Selective Vertical Conveyors • Bookveyors® Clinical • Trayveyors® • Food Service Systems • Blowers and Exhausters • Exidust® Central Vacuum Cleaning Systems • Dryest® Air Vacuum Systems

Equipment & Supplies

and rear coil, or variable-rate leaf springs, is carried over with minor specification changes. Cabs now have smaller floor tunnel in some models for increased leg and foot room. Other improvements include refinements in power brakes, more durable valve seats, increased spark-plug-gap life, and heaters. New optional equipment: Temperature-controlled hydraulic fan drive, crank-case ventilating system, additional 2-speed axle ratios, and a cab-comfort package including 6-in. foam rubber seat and additional insulation.—*General Motors Corp., Chevrolet Div., Detroit.*

Circle 254 on Reader Service Card

New Spray-Drying Nozzle

Specially designed for highly abrasive or corrosive liquids with high solids content, this spray-drying nozzle delivers a uniform hollow cone pattern with excellent atomization at substantially reduced pressures.

Called SDX, the single-inlet spiral configuration of its swirl chamber produces free vortex flow. Friction is minimized, which ups the nozzle's spray and wear characteristics. Unit is made of stainless steel with tungsten carbide used in critical wear areas—*Delavan Mfg. Co., W. Des Moines, Iowa.*

Circle 255 on Reader Service Card

Picks Up Entire Palletized Trailer Load

Seen drastically cutting trailer loading and unloading time and labor is this unique unit with integral hydraulic system.

Known as "Straddle Trailer," it picks up an entire palletized trailer load in one simple operation, holds it securely while traveling, and unloads it as a unit. Loading and unloading are easily handled by the driver, and models haul up to 40,000-lb. payloads.

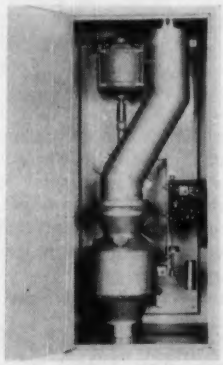
In operation, load is stacked so driver can back trailer over it. Walking-beam construction eliminates the through axle on rear tandem. Driver then operates hydraulic system which automatically centers the load as it is raised to transport position.

To unload, driver merely lowers load at desired location and drives trailer away.—*Challenge-Cook Bros., Inc., 3334 San Fernanco Rd., Los Angeles.*

Circle 256 on Reader Service Card

Meters Solids Flow

Seen as a low-cost approach to automation in processing of solids is a new meter that weights a wide range of dry-flowing materials without interrupting flow. Accuracy is 1%.



Unit ("IPI" Dry-Flow Meter) provides continuous, instantaneous, or recallable stream-flow data. It operates on an impact principle, translating unit weight of stream flow into electric current via a new type of electronic transducer. Optional instruments (1) give direct readings in unit weight per unit time from local or remote stations, (2) make permanent recordings of flow for future study, or (3) totalize readings for any time period desired.

Addition of a controller and volumetric feeder automates flow control.

Meter is about 46 in. high, 22 in. wide, 16 in. deep, and can usually be installed in existing spouting systems. — *Industrial Processes, Inc., 621 S. W. Morrison St., Portland 5, Ore.*

Circle 257 on Reader Service Card

High-Speed Labeler

Designed for wrap-around or spot labeling of cans, glass, and aerosol containers, this unit offers speeds to 1,000 per min.

Known as Model CKMD, its stainless paste belt is quickly removable for cleaning and does not drag on labels during interruption of container supply. A paste pot stationed on operator's side of machine is also quickly removable for filling and cleaning. Label box is adjustable at each end, and self-

MECHANIZE... PROFIT-WISE!

WITH A LAMSON AUTOMATIC PALLET LOADER

Gauged to handle any flow

Designed logically to receive the stepped-up mechanized flow of packaged goods from high speed production lines, the LAMSON AUTOMATIC PALLET LOADER provides the perfect link between packaging and warehousing.

Fast, accurate and dependable, the LAMSON AUTOMATIC PALLET LOADER performs a complex and variable operation for long periods of time with minimum maintenance.

Initial cost may be amortized out of savings the LAMSON AUTOMATIC PALLET LOADER effects in reducing man hours per pallet load and damage or breakage to packages.

Write for THE AUTOMATIC PALLET LOADER catalog. It may well be the answer to your particular materials handling problem. Or, simply clip this advertisement to your letterhead and mail to:

LAMSON

LAMSON CORPORATION

1107 Lamson Street, Syracuse 1, N. Y.

PLANTS IN SYRACUSE AND SAN FRANCISCO OFFICES IN ALL PRINCIPAL CITIES

New efficiency means you can now handle many mixing jobs with a smaller model drawing less power.
New shock-protected internal gear turns the mixer shaft at a slower, more powerful 350 rpm.
New super-pitch prop delivers up to 45% more fluid flow than previous LIGHTNIN gear-drive models . . . higher impeller head in direct-drive models.
ANNOUNCING

a new level of competence in the mixing of fluids

You get more work out of these all-new LIGHTNIN propeller-type mixers.

They'll handle bigger batches, heavier materials, or do the job faster —*without using more power.*

Often a smaller, lower-cost model will do the job you want done—*on less power than you've been using.* That's how efficient they are.

In normal use, you won't have to lubricate these mixers for five years. Overloads can't hurt the gear drive. The chemical plant motor is standard, at no extra cost.

Notice how we've moved the lower shaft bearing and chuck up out of the mixer base, away from the splash of tank contents. And you don't need three hands to change the shaft. New quick-acting chuck locks it tight when you turn one screw.

They're ready in eight sizes from ¼ to 3 hp, gear drive or direct drive. Ask your LIGHTNIN Mixer representative for details. His name is in Thomas' Register and in the yellow pages of your telephone directory. Or write us for descriptive Bulletin B-521.

FOR CLOSED TANKS. Same all-new design, with new stuffing box or rotary mechanical seal. Also described in Bulletin B-521.

PORTABLES, TOO. New indexing feature makes it a snap to set mixer at the correct angle. Nine sizes, ⅓ to 3 hp. Request Bulletin B-520.

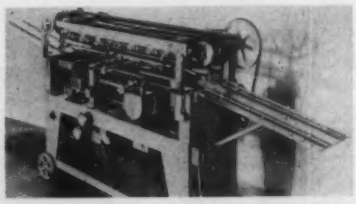
Lightnin® Mixers™

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 143-m Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Avenue, Toronto 19, Ont.

Equipment & Supplies



leveling beds automatically compensate for varying label thickness due to printing, both endwise and crosswise.

Precise labeling heights are maintained automatically, labels being added quickly and easily without stopping machine. — *Crompton & Knowles Packaging Corp., Holyoke, Mass.*

Circle 258 on Reader Service Card

New Rayon-Cord Strap Offers Many Benefits

Greater economy, ease of handling, and carton protection are advantages cited for this new rayon-cord strapping.

Called Avistrap, it is considerably lighter than steel strapping of comparable strength, which simplifies handling of coils and tensioning. Absence of sharp edges curbs injuries should the material snap, and the strapping is disposed of as ordinary waste.

Damage to shipping cartons is curbed because the cord tightens around corners without cutting of packages. And it does not rust or discolor. Strapping may be imprinted with company or product name, which affords both promotional value and clear identification.

Available in long lengths (widths from ¼-¾ in.) on disposable spools, the cord cuts downtime on

Coriandrum sativum

D&O proudly presents THE PERFECT SEASONING . . . the most scientific approach to seasonings, developed at the D&O Dry Materials Division.

PREMIUM QUALITY:

SPISOSEALS

SPISOSEALS are a line of powdered spice flavors based on spray dried oils and oleoresins, precisely formulated for use as alternates for crude spices, essential oils and oleoresins, solubilized oils, and dry solubles. There is no form of seasoning with finer, more well rounded flavor, nor any with such ease of handling.

SPISOSEALS: guaranteed flavor control and instant flavor release. Unsurpassable shelf life: these "locked-in" seasonings by virtue of the impermeability of their structure (tiny globules of oil secured each in its own individual casing) are protected against ravages of time, spoilage, volatilization.

SPISOSEALS: water soluble; completely and uniformly dispersible, both in dry products and in aqueous liquids where emulsion qualities set up a colloidal suspension system assuring permanent dispersion.

SPISOSEALS: stable, will not dry off — proved by analysis. Free from contamination, will never speck or discolor product.

SPISOSEALS may be custom formulated to replace any blend of spice flavors you are now using . . . We invite processors of quality food products to sample this new line of premium quality seasonings. Send your request to D&O Dry Materials Division, 249 Goffle Road, Hawthorne, N. J.

Write for copy of SPISOSEALS brochure

D&O ESTABLISHED 1798

FLAVOR BASES • ESSENTIAL OILS
AROMATIC CHEMICALS
DRY FLAVORING MATERIALS

Dodge & Olcott Inc.

180 Varick Street, New York 14, N. Y.

Sales Offices in Principal Cities OUR 162nd YEAR OF SERVICE

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

chain lubricants

specially formulated with "built-in" cleaning action

Any one of four specialized Oakite lubricants will, in a single operation, (1) keep your conveyor chains clean . . . and (2) provide exactly the right slip to reduce gate pressure, help prevent jam-ups and bottle breakage. That's *clean lubrication* the Oakite way.

Users also report 25% better "mileage" than old-fashioned bar soap, because down-time on maintenance is substantially decreased: Chains last longer . . . and even the frequency of motor burn-outs is reduced. You get all these "pluses" in each Oakite lubricant described below.

OAKITE 6 is a jelly-like lubricant, long proved superior for clean, chatter-free operation.

OAKITE FM 186, a low-foaming liquid, excels in hard water areas and where spillage is acidic.

OAKITE LC 106 is a dual-action paste lubricant which, because of its slow-dissolving properties, lasts longer.

OAKITE 59 is an oil emulsion that won't cake or gum in sub-freezing outdoor weather.

With Oakite chain lubricants comes the loan of a wide variety of efficient applicators. Each applies the right dosage in the right place . . . automatically.

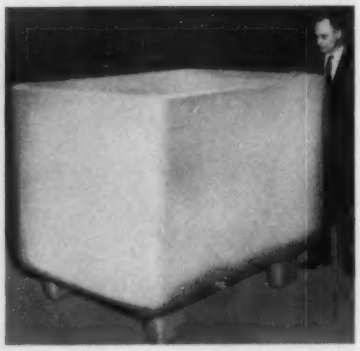
The big PLUS in Oakite

Working with Oakite is like adding a cleaning engineer to your staff. It brings a wealth of experience . . . the results of latest research in cleaning and sanitation. For free Bulletin F-10347 on chain lubrication, write Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE SCIENCE
over 50 Est. 1909 years' leadership in industrial cleaning

shipping lines because fewer spool changes are needed.—*American Viscose Corp., 1617 Pennsylvania Blvd., Philadelphia.*

Circle 259 on Reader Service Card

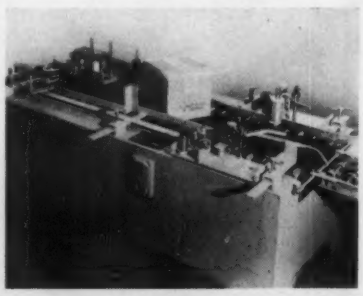


New Frozen-Food Shipper

A four-legged box of polyurethane foam and Fiberglas, this unit reportedly cuts costs and product losses for handlers of frozen foods.

Known as Hitch-Hiker, it permits economical shipment of small quantities to out-of-the-way places, minimizes heat transmission, and virtually eliminates maintenance. In addition, unit weighs only about a third as much as many conventional boxes of comparable capacity, thus savings are effected even when empties are dead-headed back to shipper.—*Space Structures, Inc., Chanhassen, Minn.*

Circle 260 on Reader Service Card



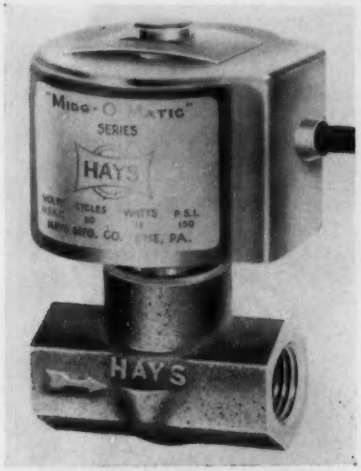
4-Side Carton Printer

Designed for quality in-plant printing of corrugated cartons, this unit obviates the storage of pre-printed cartons and eliminates hand stencilling.

Known as 4-Way Printer, it imprints product and/or code copy from 1x1 in. to 10x20 in. on four surfaces of setup cartons at 35 per min. Unit's conveyor ties in directly with existing equipment, and

handles continuous loads of 2,600 lb. Printer holds a day's run of ink (sufficient for some 10,000 cartons), and inking is by capillary action.—*Algene Marking Equipment Co., 232 Palisade Ave., Garfield, N. J.*

Circle 261 on Reader Service Card



Tight-Space Solenoid Valve

This solenoid valve, designed for accurate, automatic control of small flows of water or air, is termed the unit for solving your problem where operating space is limited.

Designated the Midg-O-Matic, valve is available in a wide range of voltages and solenoid types, and it may be secured in either angle or straight pattern. Further, flow-capacity checks show superior performance over pressures to 150 psi.

Valves are offered with solenoid coils classed as either moisture-proof or water-proof.—*Automatic Controls Div., Hays Mfg. Co., 805 W. 12th St., Erie, Pa.*

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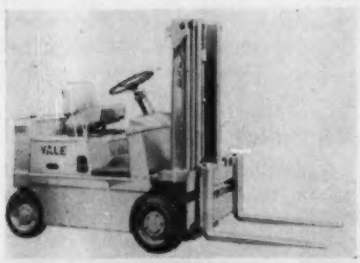


Advanced Features Cited

Innovations built into this compact line of gasoline and LP-gas powered lift trucks offer greater work capacity. (turn page)

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

floor cleaning

short-cuts detailed in FREE booklet

To really put wings on your floor cleaning program, this detailed booklet gives you up-to-date information on Oakite *mechanized* methods . . . methods that take the toughness out of floor cleaning . . . methods that combine mechanical force with detergent action to blast loose the heaviest soils . . . methods that obtain consistently fine results, reduce detergent consumption and save time.

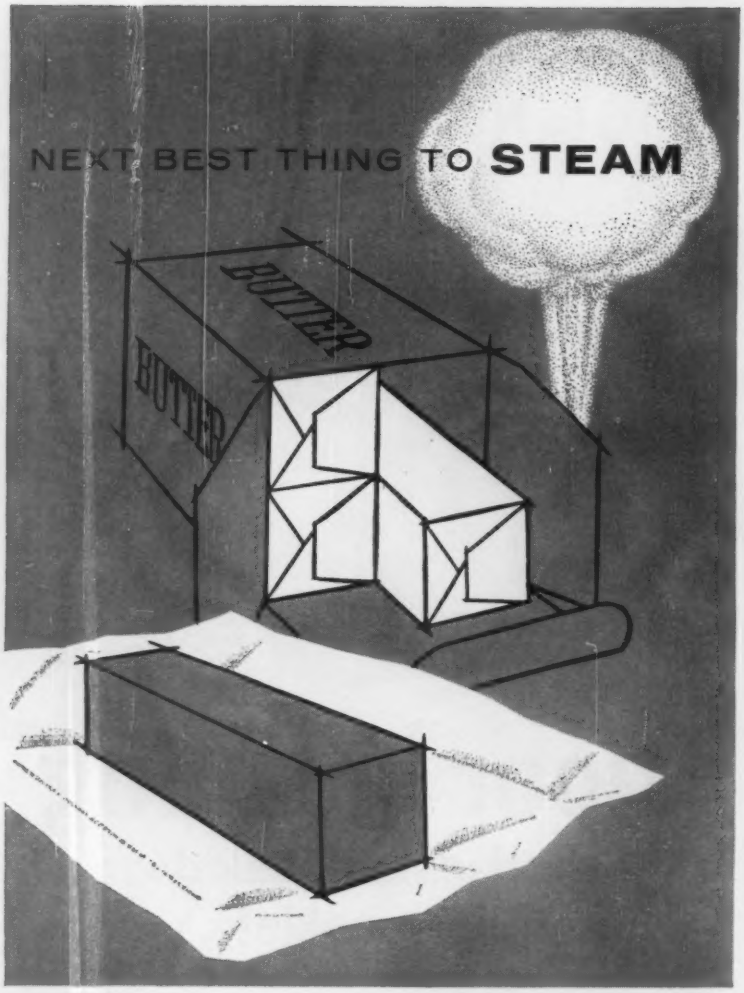
This 10-page booklet also features a valuable chart—the backbone of an Oakite Floor Maintenance Plan fitted to your individual needs. Simply check this chart for your type of floor . . . and on the same page, you'll learn about the "matched" Oakite detergent, specifically formulated for your floor-and-soil problem.

For wood, concrete, tile, metal, masonite and other kinds of flooring, the recommended Oakite cleaning procedure is fully described. Follow this procedure and you can be sure of maximum cleanliness, minimum floor wear, greater safety and less chance of costly reconditioning.

The big PLUS in Oakite

Whether your problem is floor maintenance or plant-wide sanitation, Oakite can help you do a better job . . . open up new avenues of economy. For free bulletin on floor maintenance, write Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE
over 50 Est. 1909 years' leadership in industrial cleaning
SCIENCE

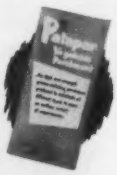


Patapar® VEGETABLE PARCHMENT

After all the precautions a dairyman takes to keep butter equipment sanitary—it makes sense to follow through with purity and taste protection in wrapping the product.

FOR BUTTER WRAPS—as well as cheese wraps, milk can gaskets, cover seals—Patapar is a ready-made combination of absolute purity with high wet strength, moisture resistance, grease and fat resistance, and attractive, crisp appearance. And, for your convenience and economy Patapar can be printed to your specifications at the Paterson plant.

SEND FOR FREE SAMPLES OF . . .



Patapar®

"Something Special In Papers"

75th ANNIVERSARY SPECIALTY PAPERS FOR INDUSTRY

PATERSON PARCHMENT PAPER CO.

BRISTOL, PENNSYLVANIA

Sales Offices: New York, Chicago • West Coast Plant: Sunnyvale, Cal.

Equipment & Supplies

Called G-54, it features improvements in power transmission, mast construction, operating speeds, stability, operator comfort, and ease of maintenance. Units are available in 3,000, 4,000 and 5,000-lb. models.

Short turning radii, 70 in. for the 3,000-lb. capacity model, plus fast lift speed (80 fpm. empty and 75 fpm. fully loaded for all models) gives faster cyclic operations. Compact dimensions increase maneuverability for operations in narrow aisles. A 3,000-lb. capacity cushion tire truck, for example, has a 70-in. turning radius. Automatic torque transmission is standard on all models.—*Yale & Towne Mfg. Co., 11,000 Roosevelt Blvd., Philadelphia.*

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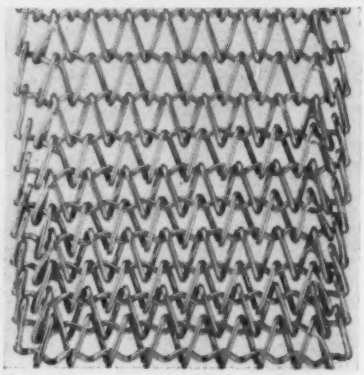


Collapsible Conveyor Belt

Just slackening this metal-mesh conveyor belt permits separating each part for quicker, easier, and thorough cleaning.

In use, unit (Collapsible Belt) is taut as shown at top of photo. For cleaning, it is slackened (bottom of photo) to expose food residues completely. Belt is available in any length or width, and in any metal or alloy. — *Cambridge Wire Cloth Co., Cambridge, Md.*

Circle 264 on Reader Service Card

No Pallet Needed

For palletless handling of bagged goods, this new attachment uses two scoop-shaped arms hydraulically actuated. A side-shifting mechanism speeds pickup and placing of loads.

Scoop arms are 45 in. long and can be spread 67 in. wide or clamped to 17 in. Arm slides are fully bushed. Maximum side shift of

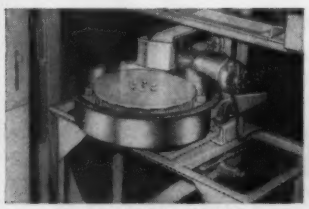
STEPHENS-ADAMSON

REDLER® CONVEYOR ELEVATORS SPEED EFFICIENCY, LOWER BULK FOOD HANDLING COST

The movement of pulverized, granular, small lump or flaked bulk foods are handled fast, efficiently and at lower cost per ton by STEPHENS-ADAMSON REDLER Conveyor-Elevators. The REDLER Conveyor-Elevator moves material by an EN MASSE action horizontally, vertically, on inclines or around bends without breakage or spillage. All movement is continuous and takes place within totally enclosed, dust-tight, compact casings, permitting large tonnages to be handled in small space. The conveying element consists of a series of U-type skeleton flights which move readily around sprockets and bend corners with relatively low power required at the drive. Skeleton flights may easily be unlocked and replaced without tools. For low handling cost per ton and maximum flexibility, the S-A REDLER Conveyor-Elevator is ideally suited to the requirements of the food industry.

S-A ENGINEERED CONVEYOR PRODUCTS FOR FOOD HANDLING SYSTEMS

"ZIPPER" CLOSED-BELT CONVEYOR-ELEVATOR BULLETIN 349



CONTINUOUS WEIGHER BULLETIN 958

NATURAL FREQUENCY VIBRATING CONVEYORS BULLETIN 353

REQUEST LITERATURE LISTED ABOVE

S-A
ENGINEERED BULK HANDLING SYSTEMS
MATERIAL HANDLING PRODUCTS
SPEEDWALK® PASSENGER CONVEYORS
RAILMASTER® BALL BEARING JOINTS
SPHERICO® BEARINGS & ROD ENDS

ENGINEERING DIVISION

STEPHENS-ADAMSON MFG. CO.

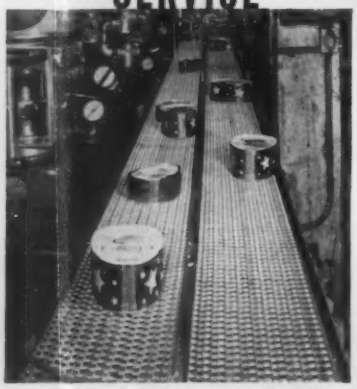
GENERAL OFFICE & MAIN PLANT, 6 RIDGEWAY AVENUE, AURORA, ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
BELLEVILLE, ONTARIO

CIRCLE 123 ON READER SERVICE CARD 123

LA PORTE
FLEXIBLE STEEL CONVEYOR BELTS

COST LESS
TO INSTALL
STERILIZE
SERVICE



More and more food plants are installing La Porte Flexible Steel Conveyor Belts to offset rising production, maintenance and replacement costs. Their sturdy, durable steel construction prevents stretching, resists impacts, wear, heat and cold. The flexible, open-mesh design assures a positive drive on the La Porte Drive Sprocket, permits the free circulation of air and liquids around products in process, also saves time sterilizing with a steam gun or scalding water. La Porte Belts provide a perfectly flat surface for the safe handling of glass, tin or paper containers empty or filled, including shipping cartons. Besides, these long-wearing belts require little maintenance.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124
La Porte, Indiana

Please send free literature on your Conveyor Belt.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Equipment & Supplies

clamps is 25 in. (12½ in. each side of centerline) when clamp opening is 42 in. Attachment is rated at 3,500 lb. and designed to fit all maker's trucks.—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.*

Circle 265 on Reader Service Card

Curbs Damage to Cargo

Inflatable dunnage bags reportedly are cutting railroad cargo damage, loading time, and material costs.

When car is loaded, bags are placed in strategic positions and inflated, which quickly locks cargo in place. Bags are removed simply by deflating. Of single-unit construction, units come in sizes up to 4x9 ft. A four-foot-square bag, inflated to a maximum pressure of only 10 psi., exerts a 16,000-lb. thrust on the load in each direction. —*Goodyear Tire & Rubber Co., Industrial Production Div., Akron, Ohio.*

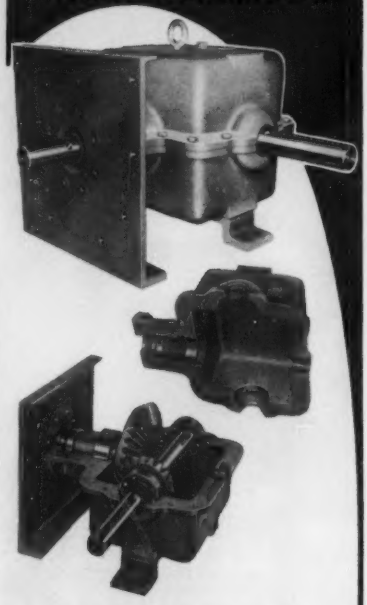
Circle 266 on Reader Service Card

Separates Air, Product In Vacuum Conveying

Offering complete separation of product and air in vacuum-conveying systems is a new filter unit.

In operation, product and conveying air enters unit (SEMCO)

dreadnaught
ENCLOSED COUNTERSHAFT ENDS for Screw Conveyor Power Transmission

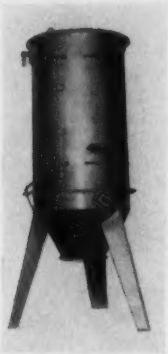


—Most COMPLETE Line . . . Most ADVANCED Design by any American Manufacturer!

The rugged DREADNAUGHT gives continuous, dependable service even with long conveyor runs. Deep groove ball bearings absorb all thrust in either direction. Available for 6" to 20" diameter screw conveyors, in 1:1 and 2:1 ratios, and in all shaft combinations. Dust-tight and oil sealed, with moving parts readily accessible. Bulletin illustrating single and multiple drive combinations and containing complete specifications sent on request.

Another quality product of

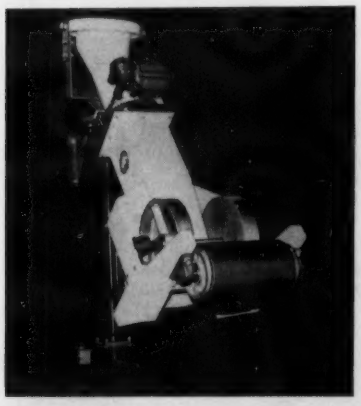
SOUTHWESTERN
SUPPLY and MACHINE WORKS
OKLAHOMA CITY, OKLAHOMA



at lower cyclonic chamber, where principal separation is effected. Dust-laden air moves upward through filtering fabric and is discharged to vacuum-producing blower. Product is gravity discharged through a rotary valve.

Filter fabric is automatically and continually backwashed with 80-100 psi. air, which prevents product buildup. Units are available with filter areas of 72-450 sq. ft., which require air flows ranging 3-20 cfm., respectively. — *Systems Engineering & Mfg. Co., Inc., P. O. Box 7634, Houston, Tex.*

Circle 267 on Reader Service Card



Speeds Box-Car Loading

This centrifugal-action, bulk material handler makes loading of even the largest box car an effortless, one-man task.

Called the Flinger, it handles practically all dry bulk materials. A short, high-speed rubber belt increases velocity of falling material in feed spout. As belt flexes over pulley, material is flung in a compact stream accurately as directed, and with minimum generation of dust.

Unit is commonly hung on a

stops sticking

speeds packaging

cuts cleanup

saves money

SLIPICONE

silicone release agent

"wherever sticking is a problem"

SLIPICONE® goes on in a breeze . . . makes any surface slick . . . keeps adhesives, packaging materials and foods from sticking or piling up where you don't want them . . . keeps equipment cleaner, more sanitary . . . assures neat, attractive packages and labels.

SLIPICONE is nontoxic . . . safe to use in contact with all foods. Stays effective over a broad temperature range . . . from 40 below to 400 above zero!

SPRAY OR WIPE IT ON

SLIPICONE comes in four handy sizes: 12 oz. aerosol can; 2 and 8 oz. tubes; 10 lb. can . . . all economical to use.

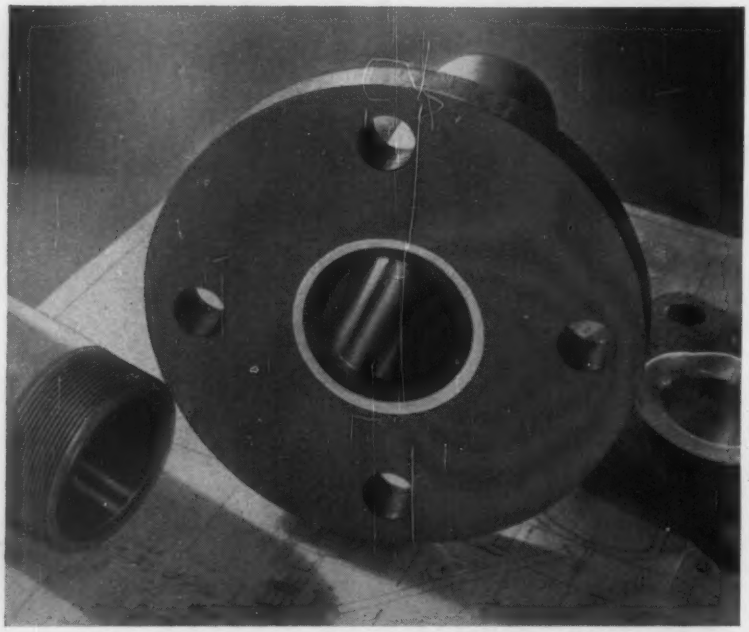
Get SLIPICONE from your paper merchant, packaging materials supplier, or write Dept. 3711a for name of nearest distributor.

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

CIRCLE 125 ON READER SERVICE CARD 125

FLUIDICS* AT WORK



F-C Glasteel pipe that protects flavor is used with ASA 150# Series thread-on flange. Gasket features Teflon envelope at product-contact area.

How to protect flavor when you pipe

Put any flavor you want through a section of Pfaudler F-C Glasteel pipe.* You'll get the exact same flavor out the other end.

The reason is simple: Unlike many other materials, Glasteel has no flavor. It takes nothing, adds nothing to what you pipe through it. Today. Or tomorrow.

With Glasteel (glass inside, steel outside) you protect the flavor, color and aroma of every product you handle. And you have the strength of steel to withstand "hard knocks" in the plant.

Even substances which might corrode other materials have no effect on Glasteel, because it is inert.

Cleans easily. Cleaning is no problem, either, because Glasteel has a hard, non-porous, extremely smooth surface. There's little chance for sticky substances to take hold. And, of course, you can sterilize Glasteel, since it has very good resistance to thermal shock and stands up to moderately high operating temperatures.

Can be "field-cut." You can fabricate this new pipe easily with tools found in most plant maintenance shops. For example, cutting can be done on most standard, dry abrasive cutoff wheels. This makes for simplicity in installation and modification. Likewise for maintenance.

Choice of sizes. Pipe has a glass lining ⅛ inch thick, is rated at 150 psi and comes in 1½, 2, and 3-inch diameters. You can get it now in limited quantities from stock in lengths through 10 feet.

More information. Details on operating characteristics and installation are covered in Bulletin 989. Ask for it or get answers to questions about availability and delivery by writing to our Pfaudler Division, Dept. FE-110, Rochester 3, N. Y.

*Patent applied for

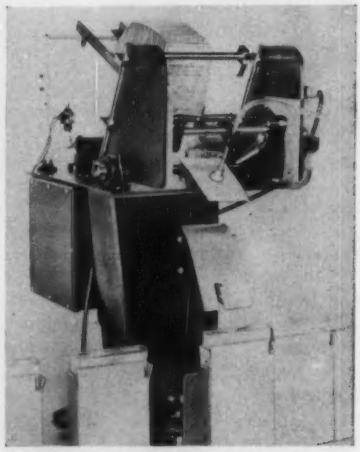
*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS... the science of fluid processes

track-side wall or structural member where loading docks are not feasible, but portable models are also available. In addition, loaders can be mounted at head-end discharge points of permanent or portable conveyors.—*Finco, Inc., Conveyor Div., P. O. Box 968, Aurora, Ill.*

Circle 268 on Reader Service Card



No-Miss Coupon Inserter

Rather than merely dropping in coupons or inserts, this new machine actually places them inside passing containers. Thus, no packages are missed in the operation.

In action, vacuum cup holding insert moves straight down into container in placing stroke, and only then is it released. And an indexing attachment further assures positive insert cycling through limit-switch activation.

Portable, fully automatic models are available in both single and multihead versions.—*Thiele Packaging Machinery Co., 1000 Berry Ave., St. Paul 4, Minn.*

Circle 269 on Reader Service Card

High-Speed Packager

Forming and filling up to 75 bags per min., this unit handles all flexible, heat-sealable materials and free-flowing products. Called Transwrap S-750, it is especially adapted to pouch packing of frozen vegetables and candy.

Bag sizes range 3-15 in. long and 2-8½ in. wide, size adjustment taking less than 15 min. Pushbutton electrical controls simplify operation, and new plug-in and seal assembly offers fast film changes.

(Continued p. 128)

This 38°F island-loading milk station (above and left) is built right onto Abbotts Dairies' bottling plant at Norristown, Pa. Its 24 doors all open on loading platforms. Its Armorply-faced walls and ceilings require no finishing after erection. And because of a patented, joint-locking device, Armorply buildings can be quickly and easily erected, moved, and expanded.

Abbotts Dairies' –20°F ice cream storage building (above and right), in Newark, N. J., has 6212 sq. ft. of temperature-controlled rooms. The Armorply-faced walls, ceilings, and exteriors need no painting, no maintenance. They resist water, dirt, and vermin. Armorply-faced rooms and buildings can be supplied for temperatures as low as –100°F.

For Milk or Ice Cream—Abbotts Dairies gets refrigerated space fast and economically with Armorply buildings

One building above is a 38°F island-loading milk station. The other is for –20°F ice cream storage. Yet Abbotts Dairies built both of them fast and economically with Weldwood® Armorply* sectional walls. That's because these metal-faced plywood modules need no costly masonry, no complex foundation. And, as prefabricated by the Freezer Box Division of Annapolis Yacht Yard, Annapolis, Md., Armorply-faced modules have a patented, joint-locking device which eliminates sealing problems and makes for fast, easy assembly. Also makes it easy to move or expand an Armorply building.

Armorply modules come faced with stainless steel, aluminum, or zincbond steel. For a free sample and full details, mail the coupon today.

Weldwood Armorply Metal-Clad Plywood

PRODUCT OF UNITED STATES PLYWOOD

See Armorply at Booth No. R-211 DISA Convention, Chicago, Illinois, October 31 to November 5.

SEND FOR FREE SAMPLE

FE 11-60

Engineered Products Department
United States Plywood
55 West 44th Street, New York 36, N. Y.

☐ Please send me a sample of Armorply and the descriptive booklet, #2133 on Armorply cooler and freezer rooms.

☐ Please have a Weldwood representative call with full details.

Name.....

Firm.....

Address.....

City.....Zone.....State.....

Grandma could get away with it!

Grandma's recipes were a pinch of this and a dibby-dab of that.

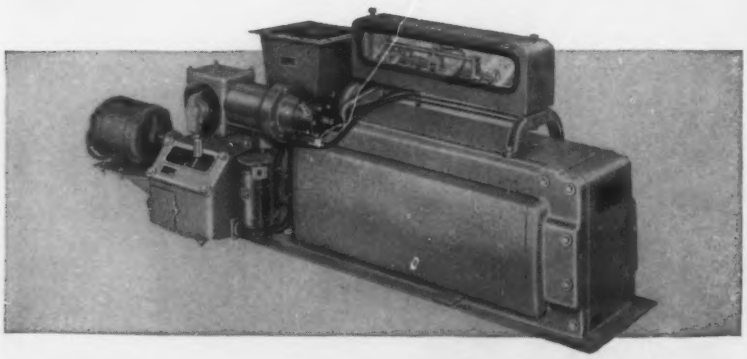
That was fine for Grandma. But it won't work in process blending. Here, you need precise control, minute-to-minute accuracy, exact formulations.

And you get just this and more with W&T's Merchen Scale Feeders and Meters. They control or measure feed rates by weight. There's no guess work. You get exactly what you set the equipment for . . . yields are known; quality is controlled.

You can feed any free-flowing solid in batch or continuous blending operations . . . as little as 3 lbs. per minute; as much as 3000.

And you do it with W&T's rugged, compact Merchen equipment—built for performance . . . built to give you profit-making control . . . built to take the "Grandma" out of your process blending.

Interested? Write Dept. M-49.37.



WALLACE & TIERNAN INCORPORATED
25 MAIN STREET. BELLEVILLE 9. NEW JERSEY

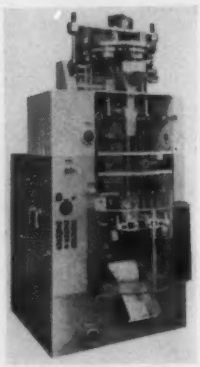
WATER ISN'T CHEAP ENOUGH TO WASTE

W&T controlled chlorination saves water and lowers treatment costs. You get maximum water value and use...even reuse.

Write for details on the new V-notch chlorinators: address Dept. S-137.37

WALLACE & TIERNAN INCORPORATED
25 MAIN STREET. BELLEVILLE 9, NEW JERSEY

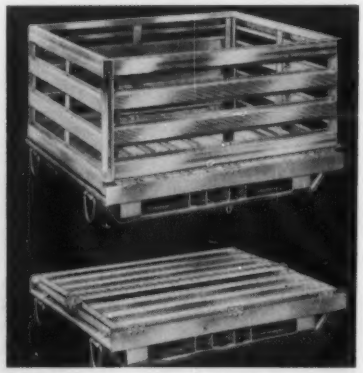
Equipment & Supplies



Sealed ball bearings eliminate lubrication, while dust and water tight mechanisms minimize maintenance.

Overall machine height is 7 ft., and all standard feeds are available.—*Package Machinery Co., E. Longmeadow, Mass.*

Circle 270 on Reader Service Card



Dual-Purpose Pallet

This aluminum pallet can be used as a container-type unit; or by folding and locking sides, as a flat pallet.

Models (Folding Basket Pallet) are available with two- or four-way entry bases for hand-lift or forklift trucks, or with sling rings and drag runners as in photo. They are lightweight, easy to clean, and supplied in a number of standard sizes. —*Louisville Metal Products Co., 1101 W. Oak St., Louisville, Ky.*

Circle 271 on Reader Service Card

Prints 12 Matched Colors On Corrugated Board

Substantial savings in multicolor printing on corrugated board are offered by a new process called Corr-Lure.

System applies up to 12 matched

colors, and a rainbow effect is also possible since colors can be blended while printing. Plate cost is the same as for a set of two-color plates, and printing cost is only moderately more than a two-color run.

Process is termed ideal for special promotions where extra colors can be used to call attention to deals or new features, or merely to distinguish special packs from regular. In addition, system perfects combination shipper-displays, where added colors provide additional attention-getting stimulus at point of sale. — *Mead Containers Div., Mead Corp., Dayton, O.*

Circle 272 on Reader Service Card

Plots Production Data

Better production-rate analysis of automatic equipment is the object of this new portable unit.

Called Annis, it plots a complete log of production rate information for any machine directly on graph paper. Instrument automatically integrates production data, constantly comparing actual rate with that of a predetermined standard. Any deviation from standard is recorded by percentage on graph.

Rates are determined for definite sampling periods such as 1, 2, 4, 8 and 16 hr. Unit uses a rugged strip chart recording mechanism and weighs about 24 lb. It operates on 115 v., 60 cycles.— *R. B. Annis Co., 1101 N. Delaware St., Indianapolis.*

Circle 273 on Reader Service Card

Compact Cascade Control

A new remote-control station contains all panel-mounted components required for pneumatic cascade control of processes with serious lags.

Employing two controllers

Elgin
EARNS ITS WAY

"60-A-MINUTE" ELGIN-WRAP

Model GSA

FOR
cellophane
waxed paper
aluminum foil
glassine, etc.

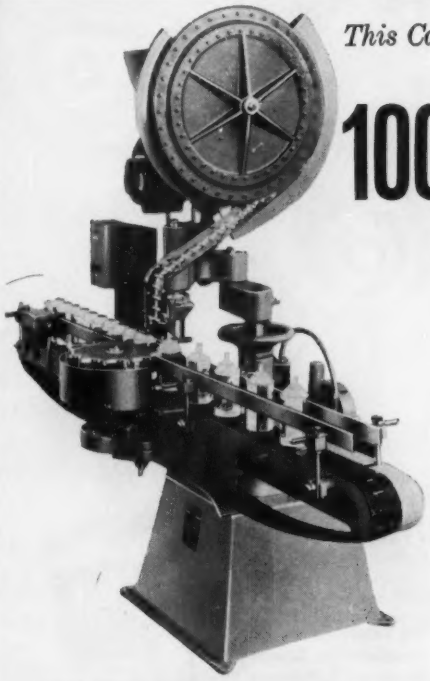
★ high-speed, straight-line producer
★ fully adjustable for package variety
★ rapid changeover adjustments

Fully automatic, the great Elgin-Wrap is built to be a steady, swift and easily maintained producer! Designed to handle heat-sealing materials, it can also be equipped with photo-electric registration controls for printed wrappers. And the Elgin-Wrap is unequalled in its price field for speed.

Send samples for quotations and recommendations on your needs.

A DIVISION OF
ELGIN MANUFACTURING COMPANY
200 Brook St. • Elgin 5, Illinois

CIRCLE 153 ON READER SERVICE CARD



This Capem H-O-FV applies more than

100 AEROSOL VALVES A MINUTE.....

The CAPEM H-O-FV sorts and applies aerosol valves at speeds in excess of 100 a minute in modern plants like Reddi-Wip, Los Angeles, and Rich Products Corp., Buffalo, N. Y. Stainless steel and chrome-plated parts are used whenever dairy industry regulations require. Electric switch gear is mounted conveniently above conveyor for easy washing at shut-down time. Simple changeover from one container size to another.

For full information on the CAPEM H-O-FV and other Consolidated packaging machinery, write: Sales Manager, Consolidated Packaging Machinery Corp., 1400 West Ave., Buffalo 13, N. Y.

(A Subsidiary of International Paper Co.)

CAPEM THE MODERN SCREW CAPPER

CIRCLE 129 ON READER SERVICE CARD

The Great Atlantic & Pacific Tea Co. • Jos. Schlitz Brewing Co. • St. Luke's Hospital • Tropicana, Inc. • Armour & Co. • Neil House • The Fish Meal Co. Standard Brands, Incorporated • Coca-Cola Co. • The Borden Co. • Swift & Co. Sperry Candy Co. • Union League Club • Miller Brewing Co. • Carnation Company • The Kroger Co. • Minute Maid Corp. • The Seven-Up Bottling Co. Wilson & Co., Inc. • Sealtest Foods • Anheuser-Busch, Inc. • Foremost Dairies, Inc. Rath Packing Co. • Pepsi-Cola Co. • Marine Bank • Falstaff Brewing Corp. Pet Milk Co. • Norbest Turkey Growers Assn., Inc. • Merchants Refrigerating Co.

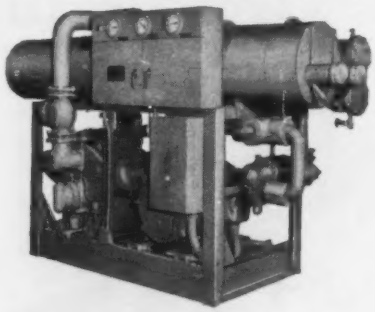
"IT HAD TO BE YOU"
...Vilter

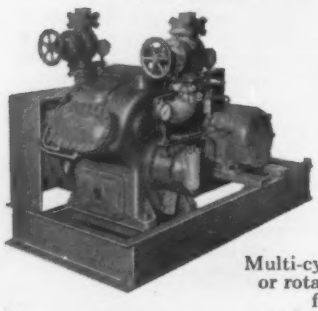
"IT HAD TO BE YOU"... VILTER is an often said and a well founded chorus among many leading American companies when it comes to selecting quality refrigeration and air conditioning equipment. (A few of the thousands of valued Vilter customers are shown above.) They all consistently look to Vilter for sound refrigeration and air conditioning recommendations and for reliable, efficient-performing, economical-to-operate equipment.

Vilter equipment finds wide application in all industries where refrigeration and air conditioning are used—from industrial installations in meat packing and poultry plants, dairies, breweries, refrigerated fishing vessels, frozen food plants—to air conditioning systems in important hotels, motels, office buildings and hospitals.

With a complete line of industrial and commercial refrigeration and air conditioning equipment, Vilter can provide a system to exactly fit your needs.

Packaged water chillers for air conditioning.





Multi-cylinder, vertical or rotary compressors for refrigeration and air conditioning.

Vilter® refrigeration air conditioning

The Vilter Manufacturing Company
Milwaukee 7, Wisconsin

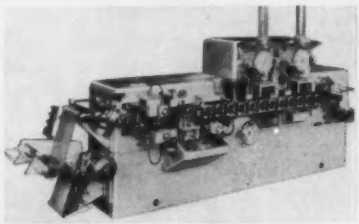
Air Units • Ammonia and Freon Compressors • Booster Compressors Baudelot Coolers • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake Ice machines.

Write for your copies of bulletins covering the above equipment to The Vilter Manufacturing Company, Dept. E-606 2217 South First Street Milwaukee 7, Wisconsin

Equipment & Supplies

(Model 58 Consotrol), unit receives measurements from two different points in the process, recording them on one chart. Output of primary controller pneumatically adjusts the set point of secondary controller whose output, in turn, operates the valve. Station occupies only 6 x 6 in. of panel frontage.—*The Foxboro Co., Foxboro, Mass.*

Circle 274 on Reader Service Card



150/Min. Pouch Maker

Dry-product packaging speeds to 150 per min. are seen with introduction of this horizontal pouch maker.

Called Type PFC, it is offered with any of three filling methods—piston, auger, and pocket type feeds. Multiple filling heads enable packaging of up to three different products into a single pouch.

Unit automatically forms, fills, and seals two packages at a time. From a single roll of stock, web is folded then vertically sealed by heating jaws which also cut the pouches. Either three-seal or four-seal type pouches can be produced from heat sealable foil, cellophane, papers, and laminations. All models are equipped with centralized lubrication.—*FMC Packaging Machinery Div., 4900 Summerdale Ave., Philadelphia.*

Circle 275 on Reader Service Card

Mylar Conveyor Belt Has Many Advantages

Superior resistance to oils and chemicals, easy cleaning and dimensional stability are advantages cited for a new all-Mylar conveyor belt.

Called Style #1000, it will not cut fingers of production workers. Available in 500 ft. x 5/8 in. rolls only, it can be easily spliced to required length. Chrome-plated eyelets and washers applied with a hand tool secure the splice.—*Lassiter Corp., 1143 E. 4th St., Charlotte, N. C.*

Circle 276 on Reader Service Card

If the proof is in the testing, here's a young fellow who's obviously had a point proven to him. Chances are that Hercules® CMC—Cellulose Gum—has been used in the formulation because Cellulose Gum is becoming increasingly popular as a stabilizer for both pie fillings and meringues.

In lemon pie fillings, such as the delectable one in the picture, Cellulose Gum is providing greater clarity, elimination of cracking and syneresis, and a more pleasing, less short texture.

In meringues, Cellulose Gum is contributing to greater volume, more uniform texture, elimination of syneresis, and because of the better stability—less toughness upon aging.

Similarly, Cellulose Gum is finding application in other bakery specialties such as fruit pie fillings, icings, glazes, doughnuts. Bakery products are only one of the many classes of food formulations which benefit from Cellulose Gum. We'll be glad to discuss the use of Cellulose Gum, which has FDA acceptance in most applications, in your specific formulation. For additional technical data on its use in food processing, write:

***HERCULES* Cellulose Gum**

Virginia Cellulose Department

HERCULES POWDER COMPANY

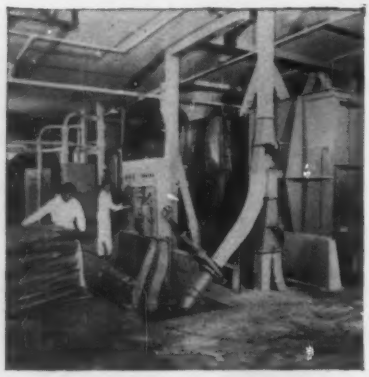
INCORPORATED

Hercules Tower, 910 Market Street, Wilmington 99, Delaware

VC60-2

Problem:

To boost starch and gum production while cutting operating costs



Solution:

SPROUT-WALDRON

UNIT MACHINES AND SYSTEMS

When Morningstar Paisley executives decided to move activities to their new plant at Hawthorne, N. J., they demanded a system meeting these specifications: extreme versatility, no dust nuisance, protection against contamination, low handling and operating costs, stepped up capacity.

The answer was found in a packaged processing system involving Sprout-Waldron machinery for crushing, mixing, grinding and sifting; plus a series of four negative pressure pneumatic conveying systems.

Blending and bagging of starch, gum grinding and gum granulation are now being accomplished with a minimum of handling and maximum of efficiency. Operating costs are down, capacity up. For the full story ask for Bulletin F-19.

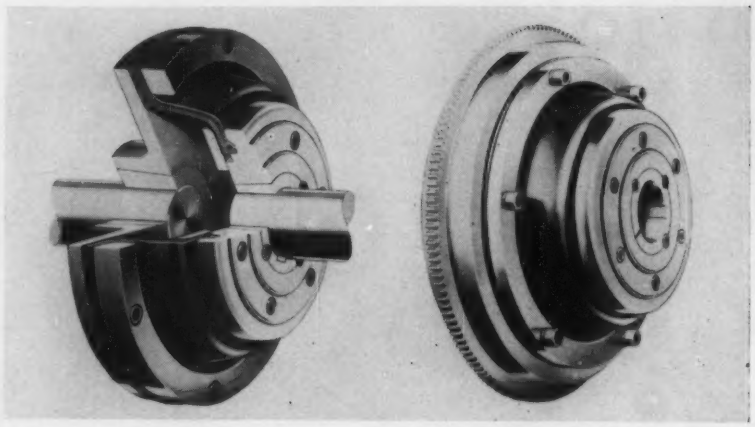
CW/107

SW SPROUT-WALDRON

Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

Equipment & Supplies



New Flexing Element Ups Coupling Performance

A pan-shaped rubber flexing element featured in two new cushion type couplings enables higher-speed operation and greater torque transmission.

Both types accommodate, either singly or in any combination, angular and parallel shaft misalignment and end float, absorb torsional vibration, and cushion shock loads.

The High Speed coupling (left photo) has the flexible member supported on one side by a clamp-ring flange, with its larger side bolted to a steel disk. Both flange and disk have maker's special bushings for quick and easy mounting on shafts. Designed for speeds up to 5,230 rpm, this unit may be used with electric motors or internal com-

NEW

compact

NOW FEATURES NEW
OCTAGON CASING AND OPPOSITE PORTS

For still more compactness and for greater ease and safety in cleaning, you can't beat the new Viking 8171A pump. Overall length of pump is reduced up to two inches with side ports permitting compact connection to tanks. Octagon shaped casing also eliminates the chance of casing rolling and being damaged when cleaning. Available in 35-50-90 G. P. M. sizes.

With these features, you also have these outstanding advantages:

- Slow speed
- Self priming
- Less weight
- Fewer parts
- Longer life
- Even flow
- Reversible operation
- Hydraulic balance
- Easy take-down
- Fast cleaning
- O-Ring seal
- O-Ring gasket

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See Our Catalog In Sweet's Plant Engineer's File

bustion engines to operate such equipment as hammer mills, compressors, pumps, and high-speed fans.

The Flywheel coupling (right photo) has its larger side bolted directly to flywheel of an internal combustion engine instead of being supported by a taper-bushed steel disk. These units are available in sizes to fit bolt circles of most standard SAE flywheels up to 19¼ in. dia.

Both couplings are offered in sizes to deliver up to 47 hp. per 100 rpm. and to fit shafts up to 4-in. dia. And they do not require lubrication.—*Dodge Mfg. Co., Mishawaka, Ind.*

Circle 277 on Reader Service Card

BRIEFS

Hydraulic Jet Cleaner features impact scrubbing for efficient cleaning of walls, floors, and equipment. Special mixing chamber with venturi injector produces high-velocity stream from plant steam and water. — Sellers Injector Corp., 1600 Hamilton St., Philadelphia.

Circle 278 on Reader Service Card

Electronic Selector and counter for conveyor lines optically selects and counts up to 31 different coded containers for discharge or routing.—Atronic Products Inc., 1 Bala Ave., Bala-Cynwyd, Pa.

Circle 279 on Reader Service Card

High-Speed Converger and balanced line divider automatically feeds up to 250 six-packs per min. into case loader. Total length of equipment, including 90-deg. carton burner, is 17 ft.—Hi-Speed Checkweigher Co., Inc., Ithaca, N. Y.

Circle 280 on Reader Service Card

Compact Code Marker has electrically activated clutch for single-revolution positive timing. Unit (Model 110) makes up to 300 impression or roll-over markings per min.—H. A. Schubert Co., 1212 Washington Ave., Wilmette, Ill.

Circle 281 on Reader Service Card

Flame-Photometer Accessory simplifies sample handling, ups speed of analysis. Autoflow system feeds manually introduced sample directly to burner atomizer.—Cole-

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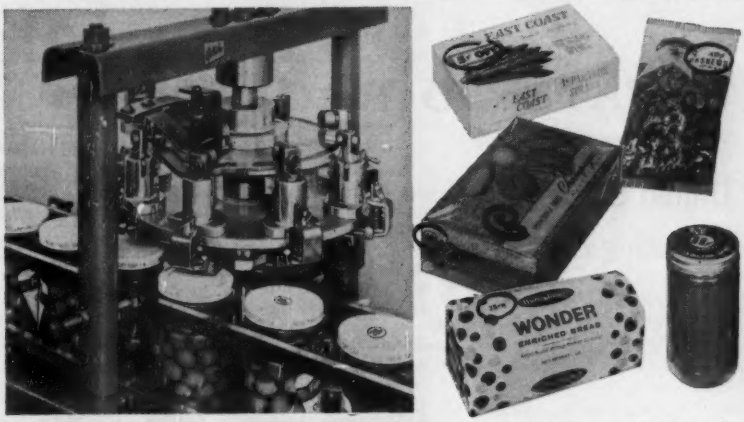

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CIRCLE 155 ON READER SERVICE CARD

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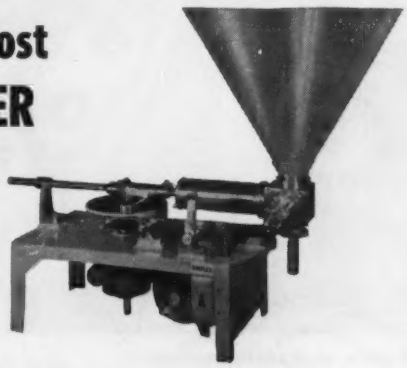

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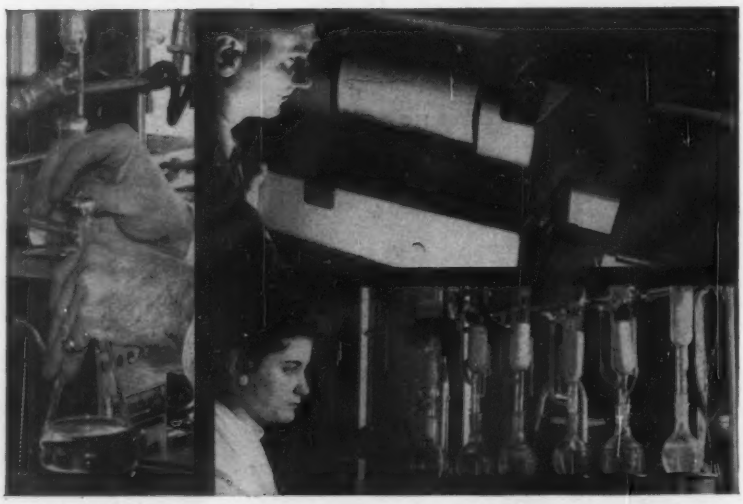

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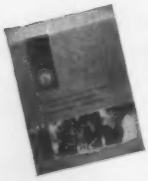

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Circle 282 on Reader Service Card

NEW SUPPLIES

Protective Paint Line includes 20 different primers and finish paints (Tykor) for variety of food-plant applications—masonry, equipment, piping, etc.—Tykor Products, 350 Madison Ave., New York City.

Circle 283 on Reader Service Card

Disinfectant Tablet, instantly water-soluble, makes 1½ gal. of solution with 650 ppm. active chlorine. Recommended for use on process equipment, walls, and floors, tablets have M.I.D. approval, are supplied in cans of 100.—First Spice Mixing Co., 19 Vestry St., New York City.

Circle 284 on Reader Service Card

Safety Solvent permits in-place cleaning of motors while in operation, also removes wax from wrapping machines. Product (SS-25) eliminates hazards of toxic fumes and fire. — National Chemsearch Corp., 2417 Commerce St., Dallas, Tex.

Circle 285 on Reader Service Card

INGREDIENTS

New Trademarks for ice-cream emulsifiers include Tween 65 (polyoxyethylene 20 sorbitan tristearate) and Tween 80 (polysorbate 80). Products have FDA approval for use in frozen desserts.—Atlas Powder Co., Wilmington, Del.

Circle 286 on Reader Service Card

Transparent Icing Conditioner renders sweet-roll frostings clear, smooth, and glossy. Product (Pic 77) is available in powder form in 300-lb. fiber drums.—Mallet & Co., P. O. Box 474, Carnegie, Pa.

Circle 287 on Reader Service Card

Cottage-Cheese Coagulator is standardized solution of rennet enzyme, associated proteins, and soluble calcium and sodium salts. Product (Shur-Seed) offers advantages of curd development in presence of enzyme action, has uniform strength, and maximum stability.—Klenzade Products, Inc., Beloit, Wis.

Circle 288 on Reader Service Card

Just Off the Press

PLANT ENGINEERING

Hinged Closures. Details new features and extended size ranges of one-man units. 6p. — Tube Turns, Louisville, Ky. (301)

Heat Exchangers. Explains design features and applications of new models. 8p. — Brown Fintube Co., Elyria, Ohio. (302)

Condensers. Gives specs and advantages of water-cooled, mechanically cleanable units for refrigeration and air conditioning. 8p. —Halstead & Mitchell Co., Pittsburgh, Pa. (303)

Refrigeration. Shows samples of firm's industrial line, including air-conditioning units. 4p. — Frick Co., Waynesboro, Pa. (304)

Generators. Describes full line of a.c. and d.c. models. 2p.—Leland Ohio Electric Co., Dayton. (305)

Transformers. Illustrates and describes complete line of custom-designed, liquid-filled substation models. 16p.—I-T-E Circuit Breaker Co., Philadelphia, Pa. (306)

Screws. Explains advantages of socket head cap types and gives dimensional data on "1960" and "1936" series. 6p.—Standard Screw Co., Bellwood, Ill. (308)

Temperature Probes. Describes 36 aerodynamic, immersion and surface types including illustrations and specs. 8p.—Rosemont Engineering Co., Minneapolis, Minn. (311)

Speed Reducers. Contains technical information and illustrations on shaft-mounted, geared models. 12p.—U. S. Electrical Motors, Inc., Milford, Conn. (313)

Pumps. Describes advantages of unique unit which handles liquids, slurries or gases by new sanitary method. 7p. — Sigamotor, Inc., Middleport, N. Y. (315)

Plastic Valves & Fittings. Gives descriptions and dimensions of units, including 4p. application table which rates effectiveness on various fluids. 16p.—Walworth Co., N. Y. C. (316)

Plastic Pipe. Gives advantages and illustrated applications of SRK installations. 2p.—Republic Steel, Cleveland, Ohio. (317)

PACKAGING

Stapling & Tacking. Describes and illustrates firm's equipment line including latest models. 32p. — Fastener Corp., Franklin Park, Ill. (344)

Package Marking. Suitable for wall display, card outlines marking regulations along with export marking data, conversion equivalents, and military marking specs. 1p.—Proper Marking Association, Inc., Carbondale, Ill. (345)

Glass. Details properties of 32 commercial glasses including information on new types. 16p.—Corning Glass Works, Corning, N. Y. (346)

Stencil Ink. Introduces new formula for use with corrugated cartons, metal, paper, concrete, fiber, fabric or other surfaces. 2p.—Reynolds Ink Co., Cleveland, O. (347)

Labels. Portfolio contains 31 samples of custom designed shapes and sizes. 4p. —Pollock Paper Co., N. Y. C. (348)

MATERIALS HANDLING

Tubular Conveyor. Shows six different industrial applications of flexible unit with capacity chart to determine system requirements. 4p.—Hapman Corp., Kalamazoo, Mich. (363)

CO_2 Blast Chilling. Introduces new method for quickly attaining shipping temperature in trucks and railroad cars. 6p.—Pure Carbonic Co., N. Y. C. (364)

Truck Cost Records. Contains daily reports to assist drivers in evaluating equipment performance. 18p.—International Harvester Co., Chicago, Ill. (366)

Conveyors. Details units designed for small parts handling. 8p. — Rapids-Standard Co., Inc., Grand Rapids, Mich. (367)

Pallets. Handy digest describes pallets and their uses. 15p. — Raymond Corp., Greene, N. Y. (368)

Conveying Systems. Illustrates and explains gains possible with firm's low density and high density units. 16p.—Day Co., Minneapolis, Minn. (369)

Conveying Equipment. Illustrates and describes firm's line with three separate bulletins detailing unscrambling tables, multi-tier unloader and powered twister. 12p. — Island Equipment Corp., Miami, Fla. (370)

Refrigerated Trailer. Describes new unit for movement by highway or piggyback. 4p. — Hupp Corp., Perfection Div., Cleveland. (371)

PROCESSING

Sausage Machinery. Case history of Ohio company and its use of firm's line. 30p.—Basic Food Materials Inc., Vermilion, Ohio. (329)

Continuous Processing. Details features and uses of 55 types of equipment. 16p. —Dorr-Oliver Inc., Stamford, Conn. (330)

Screw Feeders. Data folder lists valuable tested performances of firm's models. 6p.—Vibra Screw Feeders, Inc., Clifton, N. J. (339)

Mixers. Introduces new designs in portable line. 8p. —Mixing Equipment Co., Rochester, N. Y. (332)

Hydrogen Gas. Introduces new adsorption process for producting hydrogen gas from commercial anhydrous ammonia. 4p. — Electric Furnace Co., Salem, O. (333)

Dust Control. Explains and illustrates 13 different systems including capacities and specific applications. 11p.—American Air Filter Co., Louisville, Ky. (334)

Bakery Automation. Outlines firm's consultation service to baking industry for increased sales and lower costs. 35p.—Baker Process Co., Belleville, N. J. (335)

Filters. Descriptive data sheets cover 225 items and 20 basic types including specs for each. 22p.—Pall Corp., Glen Cove, N. Y. (336)

SANITATION & MAINTENANCE

Bird Chaser. Gives cross-sectional views and description of "automatic scarecrow." 6p.—B. M. Lawrence & Co., San Francisco, Calif. (357)

Tank Cleaner. Describes firm's new heavy-duty model for quick and economical sanitation. 4p.—Sellers Injector Corp., Philadelphia, Pa. (358)

Floor Protection. Contains information on faster, more economical epoxy plastic maintenance. — Steelcote Manufacturing Co., St. Louis, Mo. (359)

Bakery Sanitation. New purchasing guide describes products for all cleaning jobs. 4p. — Diversey Corp., Chicago, Ill. (360)

Sanitation Tools. Details firm's complete line with prices. 6p.—Huge Co., St. Louis, Mo. (361)

Interior Finishes. Gives specs and application of non-toxic, FDA approved liners. 7p. — Sherwin-Wil-

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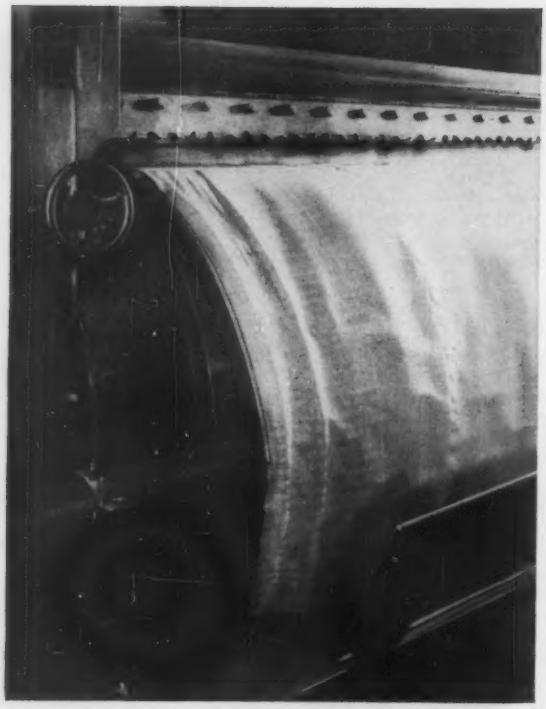

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Buflovak Equipment Division

BLAW-KNOX

liams Co., Cleveland, O. (362)

Dairy Sanitation. Illustrates and describes pre-engineered system of automation cleaning for milk tank trucks. 4p.—Klenzade Products, Beloit, Wis. (363)

INSTRUMENTS

Pressure Instruments. Describes and illustrates types of units and their uses.—2p. — Bailey Meter Co., Cleveland. (379)

Gas Chromatography. Application Data Sheet describes unit's use in analysis of flavor components in beer. 2p. — Beckman Scientific and Process Instruments Div., Fullerton, Calif. (380)

Lever Control. Catalogues various types with new fail-safe control. 2p.—Flo-Tronics, Inc., Minneapolis, Minn. (381)

INGREDIENTS

Chemicals. Contains tips on food additives with information on other uses of firm's line. 15p. — Atlas Powder Co., Wilmington, Del. (352)

Flavors. Catalogs and lists prices of maker's flavoring, aromatic and essential oil products. 31p.—Florasynth Laboratories, Inc., N. Y. C. (353)

Additives. Details FDA sanctioned ingredients for food enrichment. 3p.—Hercules Powder Co., Wilmington, Del. (354)

MANAGEMENT

Sale & Payment Terms. Summarizes payment and sale terms including payment requirements as compiled from trade, industry, and government sources. 4p.—Small Business Administration, Washington, D. C. (386)

Small Business Information. Gives information sources available through trade associations, government, libraries, trade publications, formal education, and professional advice. 2p.—Colorado Business Review, Univ. of Colorado. (387)

New Product Testing. Outlines PA&R and its available services. Includes case history of Evansville metropolitan area and studies conducted as indicative of national trends. 24p.—Product Acceptance & Research, Inc., Evansville, Ind. (388)

Improve Management. Three booklets outline minutes of GMA conclave. Topics covered are (1) "The Forward Look: The Key To Expansion"; (2) "Research: The Key To Tomorrow's Expansion"; (3) A Newcomer's Observations of What Goes On in the Food Industry, Including a Report On Washington Activities, 81p. — Grocery Manufacturers of America, Inc., N. Y. C. (389)

MARKETING

Institutional Market. An exhaustive study of inplant feeding market reports on total size of market, amount spent on food by product and type, and extent of vending machine use. Covers food service facilities with 500 or more employees in manufacturing, commercial, school, and hospital fields. 38p. — INPLANT FOOD MANAGEMENT magazine, N. Y. C. (392)

Advertising Evaluation. Presents simplified method for determining accumulative readership reached by given number of newspaper ads, including do-it-yourself slide rule for measuring rate new readers are attracted to ad. 4p.—American Newspaper Publishers Assn., N. Y. C. (393)

Consumer Preference. Reports usage of different types of desserts, beverages, and seasonal favorites, including frequency and time of serving. 88p.—GOOD HOUSEKEEPING magazine, N. Y. C. (391)

Industry Analysis. Summary of significant trends and events in food marketing for past 12 months, including vital data on 42 leading food chains. 22p.—THIS WEEK magazine, N. Y. C. (390)

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Five years in the making, this work is the most comprehensive reference in the field of science and technology ever published in the English language. It is a reference set that will never become obsolete —the publisher will offer an annual supplement entitled, "The McGraw-Hill Yearbook of Science and Technology," the first edition of which will appear early in '62.

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New Marketing Concepts

MARKETING CONCEPTS IN CHANGING TIMES *Ed. by Richard M. Hill. American Marketing Assoc., 27 E. Monroe St., Chicago 3, 1960. 412p. Price: $4.00 (members), $6.00 (non-members).*

Here is a bound digest of papers delivered at the AMA marketing conference held in Washington, D.C., Dec. '59.

Volume includes papers on federal govt.'s role in marketing depth interview as a research tool, international marketing research, consumer motivation and brand choice, frontier developments in industrial marketing, advances in marketing theory and science, foreign marketing, marketing management decision simulation, productivity increases in marketing, and developments in marketing education.

Radiation and Food

RADIATION TECHNOLOGY IN FOOD, AGRICULTURE AND BIOLOGY *by Norman W. Desrosier and Henry M. Rosenstock. AVI Publishing Co., Inc., Box 388, Westport, Conn. 1960. 425p. Price: $12.50.*

A first in its field, this book is primarily devoted to fundamentals of radiation technology as applied to food, agriculture, and biology.

Beginning with the nature of the subject, authors proceed to discuss affects of radiation on single cells, plants, animals and food and in promoting useful chemical reactions.

Latest commercial equipment, measurement and control of dosage, safety measures, and detailed cost studies are also treated.

Food and Population

FOOD FOR AMERICA'S FUTURE. *McGraw-Hill Industrial and Business Book Information Service, 327 West 41st Street, N.Y.C. 36. 1960. 192p. Price: $3.95.*

Dealing with a pressing world problem, this volume is a penetrating examination of our own nation's potential ability to feed its growing population in the future.

The book describes our present and possible future advances in the area of farm and industrial equipment geared to meet our population expansion. It outlines the goals of education in this area and gives details for more efficient management of land, labor, and capital.

Engineering Lower Costs

COST ENGINEERING IN THE PROCESS INDUSTRIES *by Cecil Chilton. McGraw-Hill Book Co., 330 W. 42 St., N.Y.C. 36. 1960. 502p. Price: $11.00.*

A vital new book for the process industries, volume is based on articles written by over 100 cost-engineering specialists.

Containing accepted methods of estimating plant, equipment and operating costs, as well as facts and data necessary for making economical analyses, standards are adaptable to many stages of the cost engineer's job.

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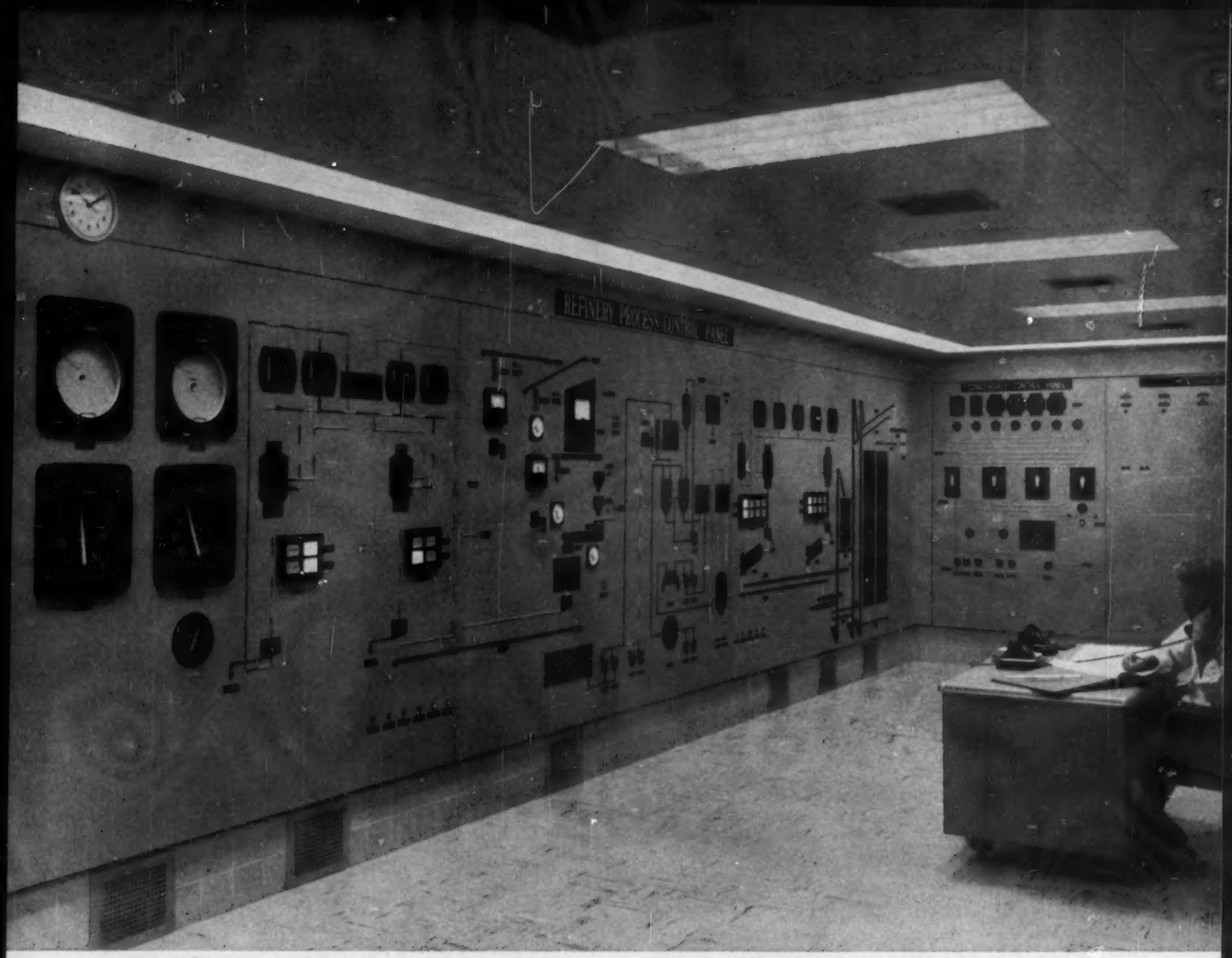

Main control panel at new Redpath Sugar Refinery—designed and built by The Foxboro Company, Limited. Process data from individual process panels located throughout the plant are also recorded here.

Foxboro control selected for new Toronto sugar refinery

"We liked Foxboro's policy of 'intelligent' automation"

Canada and Dominion reports

Raw cane sugar in at one end, packaged sugar out the other. That's the operation at Canada and Dominion's new, 15 million-dollar, 2800 ton-a-week, Redpath Refinery in Toronto.

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CIRCLE 139 ON READER SERVICE CARD 139

Recent Inventions

PRODUCTS

Spray Dried Souffle Mix Products Reconstitutable in Water to Prepare Cheese Souffle.—R. W. Kline, Armour & Co., Chicago. No. 2,939,792.

Fat-Containing Dried Dairy Product Characterized by High Wettability and Dispersibility in Cold Water.—J. M. McIntire, Dairy Products Corp., Los Angeles. No. 2,941,886.

Dough Mix for Refrigerated Storage and Baking Featuring Acidic Component in Form of Disodium Acid Pyrophospate and Fumaric Acid Combination.—A. B. Erekson, The Borden Co., N. Y. C. No. 2,942,988.

Meat Curing Composition Stabilized to Prevent Particle Agglomeration and Nitrite Oxidation. — J. A. Meusel, The Baltimore Spice Co., Baltimore. No. 2,942,989.

Malt Beverages Stabilized With Water Soluble Polvinylpyrrolidone. — P. P. Gray, Baxter Laboratories, Inc., N.Y.C. No. 2,943,941.

Foaming Beer Containing 20-80 ppm. of Phosphorylated Mannan.—E. Segal, J. E. Siebel Sons' Co., Inc., Chicago. No. 2,943,942.

Low Calorie Mayonnaise-Like Product Comprising Oil, Egg Yolk, Acidifying Agent and Stiff Gum.—J. G. Spitzer, Carter Products, Inc., N.Y.C. No. 2,944,906.

PROCESSING

Treating Fresh Meat by Intraperitoneally Injecting Broad-Spectrum Antibiotic Into Live Animal ½-24 Hours Before Slaughter.—C. L. Wrenshall, Chas. Pfizer & Co., Brooklyn, N. Y. No. 2,942,982.

Producing Sweet Coconut Milk Emulsion From Desiccated Coconut.—C. D. Dolman, Seattle, Wash. No. 2,941,888.

Submerging Curd in Whey While Collecting and Cloth-Wrapping, Then Draining and Pressing to Improve the Making of Cheddar Cheese.—A. M. Sadler, USDA. No. 2,942,983.

Fractionally Crystallizing Fats to Softening Point Below 30C. and Hydrogenating to Iodine Value of 50-65. — H. Wissebach, Emmerich, Germany. No. 2,-942,984.

Producing Flavor Base of Fruits by Counter-Currently Passing 90-145F. Liquid Through Shredded Fruit Moving Between 1st and 2nd Extractor Stages.—A. P. Stewart, Jr., Chicago. No. 2,942,985.

Concentrating Sugar Solutions With Anion Exchanger.—M. Itin, Inventa A. G. Fur Forschung und Patentverwertung, Zurich, Switzerland. No. 2,943,003.

Manufacturing Sugar by Alcohol Extraction—V. E. Haury, Santa Susana, Calif. No. 2,943,004.

Improving Character and Foam-Life of Foam-Producing Carbonated Beverages With High Molecular Weight Polyethylene Oxide.—E. Segal, J. E. Siebel Sons' Co., Chicago. No. 2,942,978.

Treating Carbonated Beverage Water With Water Soluble Sodium Polyphosphate.—W. N. Karlson, Park Ridge, Ill. No. 2,943,939.

Dyeing Citrus Fruits With Oil-Soluble Color Comprising Annatto Derivative in Hydrocarbon Solvent, Oleic Acid and an Amine.—H. J. Keller, Clearwater, Fla. No. 2,943,943.

Quick-Cooking Barley Made by Water-Soaking, Pressure Cooking, Agitating and Compressing Gelatinizated Grains Between Rollers.—E. Seltzer, Thomas J. Lipton, Inc., Hoboken, N. J. No. 2,944,904.

Retarding Meat Spoilage by Dipping in Aqueous Solution Comprising 5 ppm. Chlortetracycline and 2.5 ppm. Nystatin.—J. F. Pagano, Olin Mathieson Chemical Corp., N.Y.C. No. 2,-944,907.

Fermented Meats by Adding Bacterial Culture and Manganese Salt, Then Heating to 80-110 F.—L. Chaiet, Merck & Co., Inc., Rahway, N.J. No. 2,945,766.

Broiling Meat by Subjecting to Intense Radiant Heat in Atmosphere Free of Excess Oxygen.—L. A. M. Phelan, Rockton, Ill. No. 2,945,767.

PACKAGING

Continuous Vacuum Packaging Machine for Flexible Packages.—R. A. Mahaffy, Standard Packing Corp., N.Y.C. No. 2,935,828.

Continuous Carton Erecting and Closing Machine. — H. J. Goss, The International Paper Box Machine Co., Nashua, N. H. No. 2,935,-918.

Elastic-Type Plastic Carrier for Retaining a Plurality of Cans.—O. J. Poupitch, Illinois Tool Works, Chicago. No. 2,936,070.

Convertible Container for Bulk Shipping Produce for Repacking In Same Container.—W. C. Rendell, Crown Zellerbach Corp., San Francisco. No. 2,936,-239.

Telescopic Self-Sealing Containers. — G. A. Moore, N.Y.C. No. 2,936,944.

Container Filling and Weighing System.—H. McKinney McLearn, American Machinery Corp., Fairvilla, Fla. No. 2,936,993.

EQUIPMENT

Conveyorized System for Continuously Drying and Cooling Gelatin.—J. F. Scott, Proctor & Schwartz, Inc., Phila. No. 2,937,454.

Color Separator for Removing Impurities From Whole Corn Kernels.—F. C. Wohlrabe, USDA. No. 2,937,750.

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1—S & S Model G-1 Stainless Steel Auger Filler.
1—Triangle Carton Gluer & Sealer.
6—Stainless Jack. Kettles 50-300 Gals.
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BOX FE-36
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BOX FE-34
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

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WANTED

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BOX FE-27
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

WANTED

Air separator, double Whizzer type 6 to 10 feet diameter.

BOX FE-23
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WANTED:

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STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, JULY 2, 1946, AND JUNE 11, 1960 (74 STAT. 208) SHOWING THE OWNERSHIP, MANAGEMENT AND CIRCULATION OF FOOD ENGINEERING, published monthly at Philadelphia, Pennsylvania, for October 1, 1960.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Grahame E. Riddell, Chestnut & 56th Streets, Philadelphia 39, Pa.; Editor, Frank K. Lawler, Chestnut & 56th Streets, Philadelphia 39, Pa.; Managing editor, Alex K. Porianda, Chestnut & 56th Streets, Philadelphia 39, Pa.; Business manager, None.

2. The owner is: Chilton Company, Chestnut & 56th Streets, Philadelphia 39, Pa.

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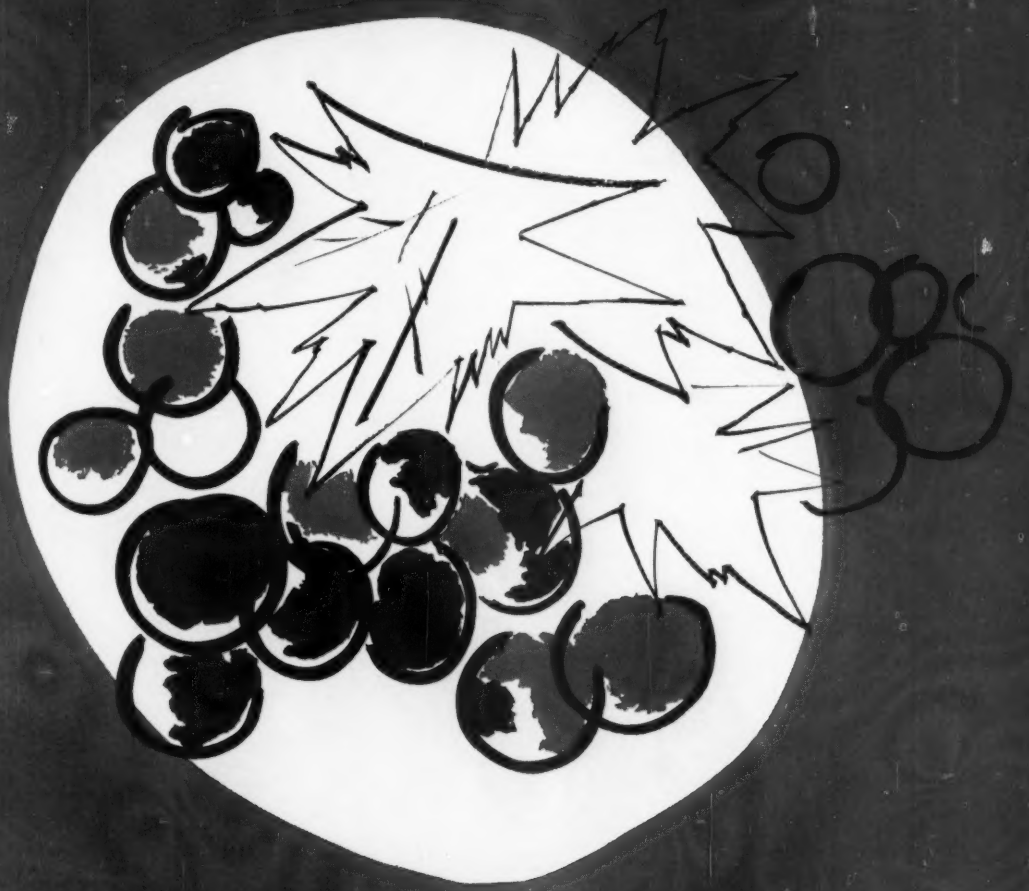

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If you have a flavor problem, we can help you. Experienced flavor chemists at IFF can create a flavor exclusively yours . . . suggest ideas for new products . . . improve flavor stability and shelf-life. If yours is an established product, IFF flavors can add new zest for renewed sales impact.

And if you are in the international market, IFF can minimize problems of supply. Uniform manufacturing and quality control in all of its plants throughout the world assure customers that IFF flavors, wherever ordered, remain the same from batch to batch.

For the flavor that's sales-perfect for your product, contact IFF.

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FLAVOR DIVISION

INTERNATIONAL FLAVORS & FRAGRANCES INC.

417 Rosehill Place, Elizabeth 2, N. J.

Leading Creators and Manufacturers in the World of Flavor

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